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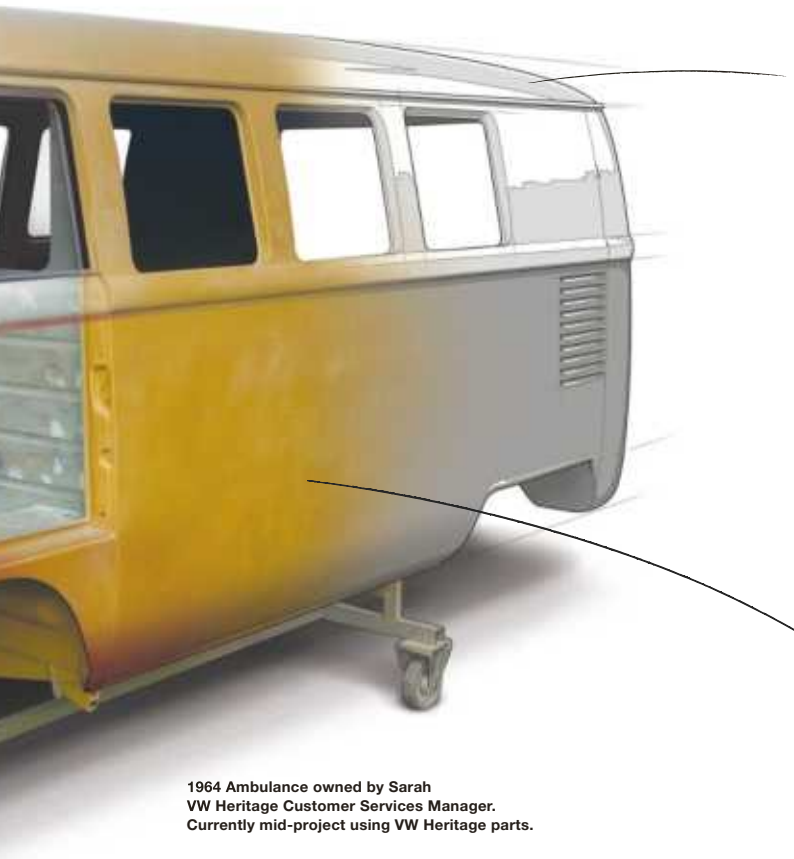

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VOLKS WORLD

Next month

The March 2017 issue of *VolksWorld* goes on sale

Friday 13 January

Don't miss it!

Welcome to the mag

While trawling through some old photos on my hard drive the other day I noticed a picture of a Zwitter being offered for sale at Stonor in 2010. It was in primer and, while I can't comment on the state of the underneath, it looked pretty solid on top. And the price? An entirely insignificant £5,000. You'd be lucky to find a similar car in that condition today for £20,000-£25,000 and indeed the mag's Mike Pye tells me there were two similar examples advertised at Spa (pics only) for €25,000. How the market's changed!

Now the jury's still out as to whether rapidly rising values is a good thing or not. In truth, values of all classic cars have risen in recent years and, while some people have inevitably been priced out of the market, there is a definite positive. Any money spent on a car is likely to see a return later on, it's a good investment – which in turn means more cars will be rescued and rebuilt rather than being broken for spares. In short, more cars will survive for future generations to enjoy.

^ This Zwitter project has gone up five-fold in value in the last six years

Benefit society

There's another benefit of rising values, one that I've witnessed first hand recently. Having dropped in on Grant Eggleton and the team at Beetlelink in Farnham and Dean Jones at Classic Car Revivals, it seems Volkswagen owners are becoming more willing to go the whole hog and commit to full nut and bolt restorations. The fact that their cars will be worth more at the end is effectively bank rolling such work so, instead of simply welding in a panel here and there to get it through an MoT, owners are spending significantly more, protecting their investment, and doing things properly.

Talking of which (ha, ha), my own project's making progress. As you'll read later, I've managed to sort the rear suspension height, and as I write it's booked in for its *Contrôle Technique*. I don't expect it to pass, but at least it will flag up what else needs doing. The next hoop to pass through will be getting it registered here in France, and to that end I've just parted with €95 and filled in Wolfsburg's online form to obtain a 'birth certificate'. I'd heard, due to high demand and the amount of investigation work involved, there was a six-month wait for one of these but I am keeping my finger's crossed that it arrive in the post a bit sooner.

^ Enthusiasts are beginning to fork out more on 'proper' restorations

v Birth certificate ordered, *Contrôle Technique* booked, disappointment anticipated…

Keeping the dream alive

Our interest in old VWs is undoubtedly fuelled by emotion, spiked by a generous dose of nostalgia. Often, the initial interest is inherited from parents, friends or neighbours – so by the time we get to own a Beetle, Bus or other VW gem, we're playing out a scene from our past. Now, it would be great to share that memory – so if you've got a tale to tell of how you first got into VWs – and the curled at the edges photos to match – we'd love to hear from you. Send your story to the usual address, namely volksworld.ed@kelsey.co.uk. In the meantime, from all of us at *VolksWorld*, kick back and have a great Christmas, and we'll touch base in the new year…

Ian Cushway
Editor

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Too good to restore?

Stored since 1972, you can't put a price on this kind of patina. But what do you do with a car like this? Mothball it again? Trailer it to shows and hope it never gets caught out in the rain in case all those layers of dust and flaky rust get washed off? Or do you spend £30,000 on a full-blown body off nut and bolt restoration? We're not sure of the answer, but it's fun mulling over the various possibilities. It appeared at a US show in the summer – read more on pages 52-56. ■

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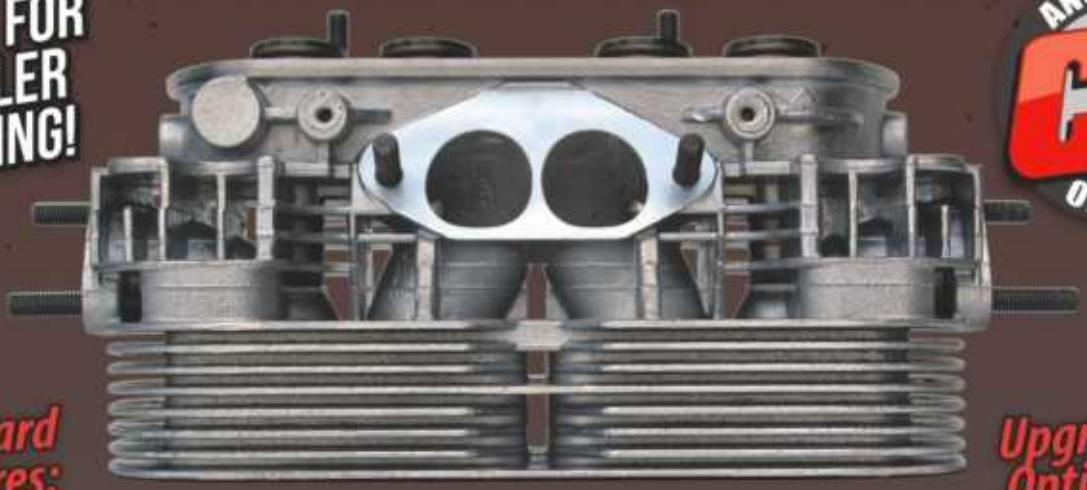

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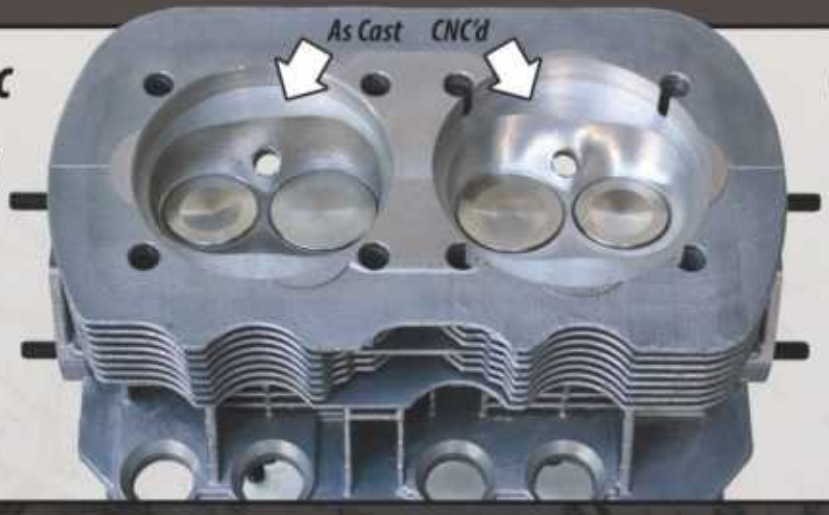

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New Show Website

Find out what is going on at the *VolksWorld* Show and save money by buying tickets in advance. The website can be found at volksworldshows.com

Show Cars

Jon Moores, a man that has displayed a top quality show car in the past, is building a Splitty for the 2017 display. As we went to press it was about to go into the paint shop and we here at *VolksWorld* cannot wait to see the finished product. If you have or are building a show quality car that you are interested in displaying, please email some brief details and a couple of pics to amy.nicholls@kelsey.co.uk

VolksWorld Magazine – 30th Anniversary

John Covery gave us a call about his Dad's buggy that was in issue 1 of *VolksWorld*. Looks like a worthy contender for our *VolksWorld* Magazine 30th Anniversary line-up that will illustrate how styles have changed over the years. We have done nearly 400 covers, so lots of great cars have graced the cover of our magazine, will your favourite be at the show? If you have an ex-cover car and would like to display it, contact Amy at amy.nicholls@kelsey.co.uk

All The Sevens

We are doing a special indoor display of Beetles and are looking for original spec cars in pristine condition with factory fit extras if you have them. Years we are looking for are 1947, 1957, 1967, 1977, 1987, 1997 and 2006 - contact adrian.vaughan@kelsey.co.uk if you can help.

Kids Are Free

We pride ourselves at the *VolksWorld* Show on keeping your little ones entertained, and the Kids' Zone is a safe place for them to let off some steam and have some VW-related fun. Entertainment includes a large soft play area, party games, film shows, colouring competitions and much more. Remember, kids 14 and under get in free when booked in advance. Get your free child tickets when you book your adult tickets online.

Buy Your Dream Drive

If you are looking to buy a VW, our 'Cars for Sale' area in the front car park is the place to head. If you want to sell your VW just turn up on the day and we'll direct you to the dedicated area.

Swapmeet Tables Going Fast

The international, indoor swapmeet is always one of the highlights of the show, with over 100 tables selling 1000s of hard-to-find parts from all round Europe, many at bargain prices. If you would like to book a table call Ben Foster on 01959 543 722. Tables cost just £110, which includes two weekend tickets to the show.

Rockabilly To Ska

We'll have an eclectic mix of music to suit all tastes, including the Del Sharrons, the Breakfast Club and even Top Bananas, the world's tallest band. They will be on hand to welcome you to the show and play all weekend for your entertainment.

Camping Tickets Now On Sale

We have so much going on at the *VolksWorld* Show this year, so why not bring the whole family – kids 14 and under are FREE. Relax, take your time and make a weekend of it. If you camp on site you get the extra benefit of quick access to the show, free indoor entertainment on Saturday evening and use of the golf course bar all weekend. If you don't fancy staying on site you can take a 5-minute walk and join 1000s of other VW enthusiasts at one of the many bars and restaurants that Esher town centre has to offer. Buy your camping tickets online now (as they always sell out) and save at the same time.

Traders

Spread over three floors selling everything you could need for your Vee Dub, the trade halls are the place to chat, pick up advice, buy parts for your ride and kit yourself out with some cool VW merchandise.

The Engine Shop

After a one year break, we are really pleased to welcome back top engine builder Jim who will be showing you how to strip and re-build an engine. Don't miss this if your engine needs a re-build.

To find out more about the show or to book tickets go to our new website or our Facebook page *VolksWorld* Magazine

www.volksworldshows.com

PRODUCTS

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Just in time...

Don't leave it too late to spring a VW-themed gift on your loved one this Christmas

> Timely Beetle

From: www.bavarian-crono.de Price: €143

Bavarian Crono's 1960 Beetle speedometer watch would make a cracking Christmas present. In keeping with the car itself, the timepiece is made in Germany and features a quality Ronda Swiss made quartz movement. Its dial and the watch hands replicate the car's original speedometer, and the watch crown takes the form of an oil filler cap. There are other watches in the range for owners of VWs from other eras.

^ Decorative Bug

From: www.vwheritage.com Price: £10.50

Start the present giving early this year with these cool little Beetle and Bus tree decorations. Made of glass, they have each been hand painted and are sold individually. The Beetle is available in green, and also silver, and the Split Bus is red; they are a great way to incorporate your VW enthusiasm into the festivities.

> Let's dine

From: www.justkampers.com
Price: Cutlery set £57.50, children's set £9.50

JK's melamine dining kit includes four stainless steel knives, forks, tablespoons and teaspoons, plus a stainless steel cheese knife and a bread board, salt and pepper set, napkins and corkscrew/bottle opener! Everything you could want for a picnic or a weekend away. The cutlery is made of quality stainless steel. And for a great stocking filler for the kids in your life – a camper-themed plate, beaker, bowl, spoon and fork set. They're designed and manufactured exclusively for JK, and are a really popular choice.

< Tent-tastic pressie

From: www.campervantastic.com Price: £44.99

This officially licensed Split Bus tent would be excellent to keep the kids occupied at shows in 2017. With UV protection and waterproof fabric it's suitable for indoor and outdoor use. Available in pink, blue or red it has a zip entrance and comes in a stylish storage bag.

Take it easy

From: www.campervantastic.com
Price: £60

Whatever the weather, chill out in 2017 with this king sized parachute silk hammock, which comes with carry bag and rope fixing kit. It's super fast to get up and believe it or not, it's big enough for the whole family. The inner sleeve pulls quickly along the hammock like a snake skin making putting it away just as easy.

Get building

From: www.lego.com **Price:** £69.99

Loosely based on an early '60s Beetle, this 1,167-piece LEGO Beetle features opening doors, bonnet and engine lid, folding seats, a removable spare wheel and a removable roof section for easier access to the interior. The engine, in particular, looks particularly realistic and the underbonnet detail is good. It would make the perfect Christmas afternoon plaything, we'd say.

Official mug

From: www.customandcommercial.com **Price:** £17.95 set

Why enjoy your favourite workshop brew in an inferior product when you can sip it out of these officially licensed enamel mugs from C&Cs Brisa range. You can buy them as a two-piece set in green and apricot or blue and grey – and because it's Christmas we'll let you lace the contents with a little festive spirit for good measure.

Bag it

From: www.customandcommercial.com **Price:** £34.94

Who wouldn't be totally chuffed to receive this handy Split Bus themed shoulder bag on Christmas morning? It's part of Custom & Commercial's Brisa range of officially licensed gifts, of which C&C are the UK distributor. It measures 25x35x10cm and features two front zipper pockets for added convenience. It's available in a range of colours, including red, orange, blue, brown, green and black and red.

The perfect gift card?

From: www.justkampers.com
Price: from £10

Stuck for what to get the VW enthusiast in your life for Christmas? Can't face buying anymore knick-knacks with a camper on them? Get them a JK Gift Card and they can buy themselves what they want (or need) from Just Kampers!

Each gift card is valid for 12 months from the date of purchase, and you can load them up with between £10 and £5,000 (if you're feeling incredibly generous!). The cards themselves are credit card size and can be used either over the phone or online on any number of orders up to the preloaded value.

Tour de France

When Andrew Leggett bought a Beetle off an auction site as his first car, little did he know just how much work would be needed before he could embark on a 2000 mile trip around France with his girlfriend

Being brought up by a mechanic with a passion for classics, it's no wonder my first car ended up being a Beetle. That said, it still came as a bit of a shock to my mother, especially when I announced I would be driving it the 200 miles home from Norwich the next day. I embarked on the journey with great excitement, loving every second of it. The difference in driving it compared to my instructor's brand new Focus or my dad's diesel Peugeot was something special and I was surprised to have people come up and compliment me on the car when filling up 10 miles down the road. However, it wasn't all plain sailing, and it took me eight hours navigating slow country roads without the use of either petrol gauge or speedometer to get back to Shropshire.

My parents' concerns and worries about the 1973 1300 Beetle I'd bought off an auction website with 'minor work needed,' turned out to be well founded once I arrived home and my dad had looked over the car. There was indeed work needed. Half of the car had rusted to pieces and the whole body was about to drop off, the horror of it all creatively concealed with a mixture of body filler and bath sealant. Alongside the rust problems, the car also seemed to have a great deal of play in the steering, as well as detached shock absorbers and a blowing exhaust. After assessing all the problems with the car, we began the lengthy (and expensive) process of ordering the necessary parts which started to make my bargain first car feel a bit more like a money pit. Although costs were starting to mount, we managed to source repair sections very easily, including two new heater channels and the rear cross-member. We set about cutting out the old rusty heater channels and found all sorts of materials buried in the car, including large sections of rock-like body filler and tons of bath sealant. We even found a shopping bag hidden inside the filler.

^ Andrew quite rightly feeling very proud of his Beetle, especially as it had just successfully completed the 11-hour drive to the Pyrenees when this shot was taken

< Andrew bought the car unseen off an auction site as his first car

> Unbeknown to him at the time of purchase, extensive welding was needed, the heater channels proving the most time consuming part of the restoration

Having a trained mechanic for a father is a huge help when buying old cars off the internet, especially when they accept payment in the form of Toblerone, and he worked tirelessly and often late into the evenings cutting out rust and welding in new sections. He even purchased a gazebo so that he could continue in the rain!

Canned laughter

Once the welding had been done, the end of the restoration was in sight. Other jobs included replacing the steering box, shock absorbers and troublesome track rod end boots. When this was all done I was able to start work on the aesthetics. I replaced the rotten wings and decided to respray the whole body as it looked a bit like a car version of Frankenstein at the time. Unfortunately, as I only graduated from university in July, my respray budget couldn't quite stretch to the £1500 that would make the car look great. So in true student spirit, I was able to stretch every penny and do the whole paint job myself with five cans of primer, 15 aerosol cans of spray paint and a few cans of lacquer. After some nauseating hours and a couple of failed attempts on the wings, I was able to get a uniformed finish that was close to the original on the car for only £70. Originally, I had hoped to get it through its MoT the week after buying it, but this was by no means the case and it

'73 1300 Beetle

Have Beetle, will travel. Driving through the Verdon Gorge was absolutely stunning, says Andrew. And just look at those empty roads

Work in progress. With the new heater channels in place Andrew could began to see the light at the end of the tunnel

He breathed a huge sigh of relief when the car started to have more metal than rust again

Andrew absolutely loved waking up to this view in the Alps

Andrew's dad even built a gazebo so he could continue work on the car when the weather got bad!

was almost two months later that the car drove away from a local testing centre with a valid ticket.

Over the following couple of months, I slowly crossed the Beetle's remaining foibles off my 'to-do' list. After running out of fuel on the motorway twice, I eventually got round to fixing the fuel gauge. The only other time I had to call the AA was on the way down to Plymouth to see my girlfriend, Libby's, sister, when a spark plug lead came loose (yes, I know I should have spotted that). During this time I was nurturing the idea of driving around France for two and half weeks and somehow I managed to persuade Libby that it would be an amazing experience.

One for the road

We ambitiously set off on our clockwise perimeter route of 2000 miles around France starting in Dunkirk then travelling to Lille and then on to Paris, Lyon, the Alps, Verdon, St Tropez, Pyrenees and then north on our return leg through La Rochelle, Brittany, Normandy and finally back to our ferry in Dunkirk. With all the correct European breakdown cover in place, a few tools packed in the car and a well-rehearsed "la voiture ne demarre pas", we set off for Dover. Having recently purchased and restored an old roof rack, we decided to sacrifice a couple of mpg and sling our bikes on top of the car for the trip. Parking fees became a thing of the past as we cycled whenever we could. We found that cycling was almost as fast as driving when tackling the Alps and the Pyrenees.

Despite the apparent slowness of the car in the mountains (20mph uphill and 55mph on the flat for maximum fuel economy), I was impressed that a 43-year-old engine, which hadn't used any oil since purchase, was able to climb near vertical ascents, full to the brim with camping equipment, two bikes and half of the nearest town's wine and cheese department in the back.

The Verdon Gorge was one of the best driving experiences ever, the winding canyon road was relatively quiet and we were able to enjoy the stunning landscape in glorious sunshine. Discovering that a camping table was practically designed to fit on top of the fuel tank, parking somewhere with a view and having a picnic became the standard lunch routine. Verdon was no exception and it was essential to enjoy fresh bread with goat's cheese and local ham from the top of the canyon looking down at the gorge below us. After exploring this part of the south coast and visiting the bay of St Tropez and its beaches, we set off on our longest leg of the trip and biggest test for the recently restored classic. The impending 11-hour drive was slightly daunting, especially with 35-degree heat forecast for the day and no fan or air conditioning to speak of. The previous journeys revealed that Libby apparently has a three-hour tolerance in a '50-degree greenhouse with plastic seats', before she says something about it. I was a bit worried about the long term effect the route would have on our relationship. However, we ploughed on through the heat (with occasional breaks in supermarkets where we could find them!) and arrived in the Pyrenees still awake enough to crack open a bottle of local wine when we got there.

> "I was a bit worried about the long term effect the route would have on our relationship"

Mission accomplished

After spending a few days in the mountains we hopped back on the toll roads. Having spent the first week avoiding motorways and enjoying rural France, we decided that taking a more direct route home would save us from a couple more nine-hour drives. I turned 22 while away on 30 August and woke to a lovely French breakfast before setting off to explore Mont St Michel and Normandy. We then visited Pegasus Bridge and Sword beach from the D-day landings, before spending our last night in France in the town Rouen. The next day we caught our ferry back from Dunkirk with a sigh of relief when we arrived on British soil that the car had survived over 2000 miles.

We'd done it – and without any major hitches. Testament, if any were needed, to all the hard work me and my dad had put into the rebuild and the fact that a classic Beetle is still a fun thing to travel in.

Your travel tales

Tell us about your roadtrip – email VolksWorld.ed@kelsey.co.uk

Back to basics

The Partner, Ant, Country Truck or EA 489 Basistransporter...whatever its name, the chances are you've probably never heard of this primitive but pioneering Volkswagen

Words
Richard Gunn

Nobody could ever describe Volkswagens of the air-cooled era as particularly luxurious. Business-like and utilitarian perhaps, even if possessed of a certain style and flair all of their own. However, when it comes to being really rudimentary, no VW out-Spartans the EA 489 Basistransporter.

If you're unfamiliar with the EA 489, you're probably not alone – it's one of the least well-known of Volkswagens. And if you're further bewildered by the shape – well, what there is of it, for it looks like something you'd buy flatpacked from IKEA – then its story is worth telling.

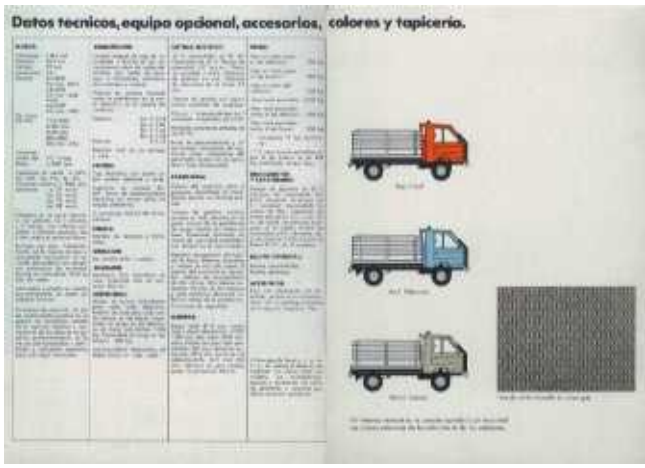
The Basistransporter was Volkswagen dipping a toe into the world of ultra-basic vehicles – only its 1940s Plattenwagen was more elementary. But this came along 30 years after that Wolfsburg factory runaround. It made the Kübelwagen look like a Bentley by comparison. Yet, despite its simplistic nature, some of its engineering went again the VW grain. For example, although it had an air-cooled engine, this was mounted at the front, powering the front wheels.

"It made the Kübelwagen look like a Bentley"

During the 1970s, several manufacturers tried to come up with very basic, uncomplicated and cheap vehicles for use in poorer countries where more advanced machines would be too complex for the local conditions. The Beetle, rugged old beast that it was, was already pretty ideal for such environments, which is how it had managed to worm its way across the globe and end up being built in numerous countries. However, the Beetle was a car. What was really needed to help struggling economies was a truck.

Knocked into shape

Enter the EA 489. What Volkswagen came up with was a very primitive ladder chassis with torsion bar front suspension and a leaf-sprung beam axle out the back. The 1584cc flat-four engine was mounted under the cab and, with its mighty 44-50bhp, was able to propel the Basistransporter to a heady 53mph. It powered the front wheels, so was essentially the usual VW configuration just mounted the wrong way around, so to speak. And with wheels that had to steer, of course.



You didn't get a lot of colour choices with the Mexican EA 489 – basically orange, blue or white

But what really made the EA 489 stand out was how it looked. Forget frills. Forget any sort of adornment for that matter, save for the trademark Volkswagen roundel affixed to the nose. And definitely forget curves, for that matter. When shipped abroad, the Basistransporter was supplied just as a chassis with engine and transmission. But it also included plans for a body that could be simply made from sheet metal in the country it ended up in, using the minimum of skills. The glass itself was also flat, so it could be fabricated or replaced with few hassles. A variety of bodies could be fitted behind the enclosed cab, such as pick-ups, vans, minibuses, caravans and ambulances. Although the Basistransporter possibly wasn't the ideal vehicle for speedily rushing anybody to hospital.

Manufacture of the EA 489 – at least in its skeleton form – was at Germany's Hannover plant from 1975, where more sophisticated Type 2 were also constructed. Around 2600 kits were sent abroad up until 1979, with very few being put together in their entirety in Germany. Needless to say, there's now one in the Wolfsburg

Got milk? No problem with a EA 489 fitted with a pick-up rear

A prototype Basistransporter in September 1973

The Basistransporter was surprisingly compact – not that much bigger than a Polo

An EA 489 in its basic cab form. Practically any body needed could then be fitted

Museum. Initial exports – mainly for evaluation purposes – were Australia, New Zealand, Papua New Guinea, the Philippines, Pakistan, Indonesia, Turkey and Mexico. Some, named the Teijo, were built in Finland by the Wihuri Group, with a slightly different cab made from reinforced plastics and styled – in the loosest possible sense of the word – by racing car designer Max Johansson. Around 200 were completed and mainly sent to Africa up until 1976, before the Toyota HiAce stole its glory.

You didn't get a lot of creature comforts inside a Basistransporter. It was all very basic

Global success

However, it proved more successful elsewhere. After checking out what they had been sent from Germany, the Philippines, Turkey, Indonesia, Mexico and Pakistan all ended up building and selling the EA 489. Turkey continued to call it by that designation, although made it look a bit more attractive by grafting the front of a Bay Window Type 2 onto the cab. In Indonesia, the name used was Mitra (meaning 'Partner') and there was a small grille on the front, while the Philippines dubbed its version the Trakbayan ('Country Truck') and Mexico christened it the Horminga (Spanish for 'Ant'). Construction there, in the country that loved air-cooled VWs even more than Germany, was from 1977 through to 1979, with around 3600 bolted together. That may have been a small fry by usual VW standards, but the ruggedness and straightforwardness of the vehicle, in a country where parts are so readily available, means examples this rough-and-ready, easily-fixed transporter are still going today. Crude but effective.

Despite its love of front-wheel drive for its water-cooled cars, Volkswagen repeated the exercise of an air-cooled vehicle with its leading wheels driven just once more. It was called the Gol. But that's another story for another issue… ■

One of the very few German-built Basistransporters, complete with a grille. Mexican versions didn't have this

A Mexican Volkswagen Horminga – no grille, but the Volkswagen roundel was there, naturally

Just some of the many fun working things you could do with your EA 489

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Electric Beetle

Current thinking

Go one step further in keeping your air-cooled VW on the road by converting it to electric power. We find out what's involved and whether it's the future for classic cars

Words Rob Hawkins **Photos** Timm Eubanks

With the threat of some European cities banning carburettor-fuelled classic cars, and the emerging hybrid technology, some forward thinking VW enthusiasts are looking for the light at the end of the tunnel for air-cooled VWs. Like it or loathe it, electric power in some shape or form appears to be the way forward, but is it really feasible to convert your Beetle, or Bus / Karmann Ghia / Type 3 to run on battery power? And is it the right way to go to future-proof your VW?

This type of conversion isn't new, but there are now companies in the UK and the USA offering a made-to-measure kit that fits in the same location as the engine on the Beetle, and requires no modifications that mean the original petrol engine can't be re-fitted if required.

In brief, converting a Beetle to electric power requires the petrol tank and engine be removed, but not the gearbox. An electric motor then bolts directly to the gearbox using the original four engine mounting points, batteries are located up front and the whole thing wired up. Simple. All four forward gears can be used if required, but there's sufficient torque from the electric motor to just select third gear and drive the car like an automatic. But what's the catch? Well, price is a big one.

How much?

The conversion kit Electric Classic Cars (ECC) in Wales offers for the Beetle costs from £18,995, and takes between a week and two weeks to fit once the engine has been removed. The kit was originally designed in the USA by EV West and, as a distributor of EV West products, ECC worked closely with them to develop its own version that accounts for the differences between American and European charging points, left and right-hand drive vehicles and climate.

Electric Beetle

Photos: ECC

From this angle there are no visible indications whatsoever that ECC's 1965 Beetle is electric. And that was the whole idea – to maintain the classic looks, but with a 21st century powertrain

EV West's conversion requires the engine lid to be raised to recharge the batteries while, much more sensibly, ECC's conversions allows the lid to remain closed

Small battery monitor on ECC's demo car displays battery power as a percentage. With approximately a 100 mile range, each percent it drops below 100 indicates miles left on a single charge

The ECC kit includes an AC motor from HPEVS, a controller, battery charger, batteries, battery boxes, cables and all the necessary fixings. The standard set up offers a range of up to 100 miles, though upgrades are available that will allow greater range and more power. It takes around eight hours to recharge the batteries using a standard 10-amp battery charger, or a faster 32-amp charge point can be installed at your home. There are also, increasingly, recharging points available at some motorway service stations, superstores and other city centre locations.

The 37 lithium-ion batteries, which total 118V, are stored in battery boxes in two locations – under the bonnet, roughly where the petrol tank was located, and behind the rear seat. Whilst these provide power to the electric motor, a separate, smaller 12V lead acid battery powers the headlights, windscreen wipers and any other accessories. This battery is charged via a DC (direct current) to DC converter that takes a feed from the lithium-ion batteries and doesn't need to be

Electric transplant by ECC in the UK keeps a tidy engine bay with the electric motor, cooling components and main cables all neatly positioned

The lithium-ion batteries are stored in two separate boxes, one in the luggage space up front, the other behind the rear seat. An added bonus is improved weight distribution

VOLKSWORLD

WHAT WE THINK

Being honest, as a dyed-in-the-wool old car petrolhead I am doing a fair amount of chin scratching at the prospect of switching to electric. Especially as the characteristic sound of an air-cooled Volkswagen is what gives it soul, and to a huge extent it's the reason we love 'em. Hoik out the engine and what are you left with? Exactly. Spending another £20,000 on top of a restoration puts this kit way out of the reach of most VW enthusiasts. Would people be more inclined to consider this option, we wonder, if it were £5,000? Who knows. The lack of range is another issue – how would this work on a road trip to a continental show where fixable minor mechanicals are par for the course, but being left stranded by the roadside at night with a flat battery and nowhere to charge it probably isn't. Perhaps the infrastructure isn't quite there yet.

I am no troglodyte, I even recycle torch batteries, so I am pleased it's an option. If petrol is banned under some evil new order, it would be great to do it but ,in the meantime, I'll stick with my joyfully antiquated flat four – Ed.

> It may not be a flat four, but an engine bay detailed to this standard would surely be capable of winning trophies in the show 'n' shine

> Out with the old and in with the new. Electric conversion arguably looks less cluttered than a traditional petrol engine

"is it the right way to go to future-proof your VW?"

ELECTRIC JARGON BUSTER

Battery charger: An onboard charger that recharges the lithium batteries via a mains power cable. Many types are available to enable charging from a 10A domestic socket up to rapid chargers that can charge a car in 20 minutes.

Battery Management System (BMS): Essential if using lithium batteries to ensure each cell is not over charged or overloaded. Usually integrated with the controller and battery charger.

Contactor: Large safety cut-off switches that are powered just like a relay, but have very high power capability.

Controller: A sort of DC transformer that controls the amount of voltage delivered from the batteries to the electric motor.

Regenerative braking: Upon braking or overrun, the electric motor can be turned into a dynamo to feed power back into the batteries and help recharge them. In tests in the hills of Wales, ECC found this can add up to 20% more range, depending on driving habits and the terrain.

Throttle pot: This controls the speed of the electric motor, via a cable from the accelerator pedal. ECC's kit uses a Toyota pedal.

as large as a traditional car battery, mainly because it doesn't need to turn over a starter motor.

Should you feel the need for one, an electric brake servo can be used, or one can be belt driven off the electric motor. With no engine in an air-cooled VW, there's no heater, so ECC offers a ceramic heater, similar to those used in production electric cars, that is powered by the main battery packs.

How fast?

The electric motor installed by ECC produces 71bhp – significantly more than most stock VWs – but here it's the torque that matters, and that equates to 120ft. lbs throughout the rev range. Having all this torque available from zero rpm means a Beetle equipped with this set up can accelerate from stationary to 60mph in nine seconds, going on to a top speed of around 100mph. "But the instant power delivery of the electric motor makes it feel a lot more powerful than the numbers would suggest," comments Richard Morgan at ECC.

It has two modes – Power and Eco – switchable on the move from inside the car. The Eco mode offers slightly softer acceleration and more regenerative braking, while select Power mode, dip the clutch, snick it into second and the car really takes off. "It'll keep up with modern traffic, and then some," says Richard with glee. Due to the increase in power, and a 60kg increase in weight, disc brakes have been added to the front (the regenerative effect works on the rear brakes) and a thicker anti-roll bar and camber compensator used to stiffen the suspension somewhat. One further benefit you may not have considered is an improvement in weight distribution, the forward battery pack making for a better balanced, less tail-happy car.

The real ethos behind this conversion, though, was to retain the soul of the Beetle. So everything about the car other than the drivetrain and the couple of modifications mentioned is bog standard. Aside from the lack of exhaust, there are no visible giveaways from the outside, with even the recharging socket neatly hidden behind the rear number plate, and just one additional gauge inside.

"What's encouraging is to see the classic car market is not being left out"

^ The ECC conversion is based on that developed by EV West in California, but brought in line with UK electrical requirements

How far?

Another benefit is the lack of servicing or maintenance required. "The electric motor has one moving part," explains Richard. "Compare that to a petrol engine and you'll understand why the benefit of having zero maintenance on an electric conversion is such a big plus. Simply switch the car on and go, for simple, reliable, trouble-free and fun motoring." But for how long? ECC's current demonstrator, the red 1965 Beetle shown here, will do roughly 100 miles on a single charge and has so far covered over 2,000 trouble-free miles, including a run to Bug Jam from mid-Wales last summer.

How safe?

However, if all this sounds a bit too good to be true, there are still a number of issues surrounding electric cars, with safety perhaps the biggest concern of all. Fully charged, the lithium-ion batteries store up to 22 kilowatt hours of energy, so justifiably there are fears of electrocution (it happened in Formula One,

with all the millions spent on technology there) or the potential for the batteries exploding in the event of an accident. After all, if a technology giant like Samsung failed to get it right with its Galaxy Note 7, is there really any hope for emerging electric cars?

"Electric cars come with various safety features and fuses," Richard explains. "With modern media being the way it is, you can rest assured that if any of the one million-plus electric cars currently in use had blown up in a crash, it would be all over the news. If you want to make something dangerous, take a load of petrol, something hot like an exhaust, something to make a spark and drive it at speed down the road. Something like a petrol engine car!"

Another concern that has been raised with electric cars was originally seen as an advantage. With no engine noise, people simply don't hear cars coming, and there have been numerous incidents of pedestrians being run over, or close calls, but Richard is quick to counter this argument, too. "There are also a number of petrol cars on the market that are just as quiet around town."

Perhaps the biggest concern of all, though, is the range, or lack of, and this is still seen as the biggest drawback of electric vehicles. However, technology is constantly developing, with faster recharges, longer lasting batteries and regenerative braking all helping to put an end to this issue. The latest Tesla 100D, for example, has a range of 380 miles and claims a 0-60mph time of 2.4 seconds, but at well over £110,000 you pay dearly for such technological advancement. More relevant here is the fact ECC claim its next Beetle conversion will have a range of over 200 miles, and a 0-60mph time of five seconds. Sadly, we suspect it too won't be cheap.

If we're honest, we'd say electric power conversions for classic vehicles such as the Beetle are not financially viable at the current time (no pun intended). We haven't done the maths but you'd have to do an awful lot of miles in your electric Beetle to recoup the installation cost and, given all our experience with cordless drills, mobile 'phones, laptops etc. one can't help but wonder whether the batteries would even last that long without needing replacing. There is no doubt, however, that electric power is a very real alternative, especially if you live in a major city, and it's inevitable that prices and charging times will come down and range increase as the technology is further developed. What's encouraging is to see the classic car market is not being left out, and if an electric conversion offers the opportunity to carry on driving your beloved VW long into the future, we're all for it. ■

THE ACID TEST

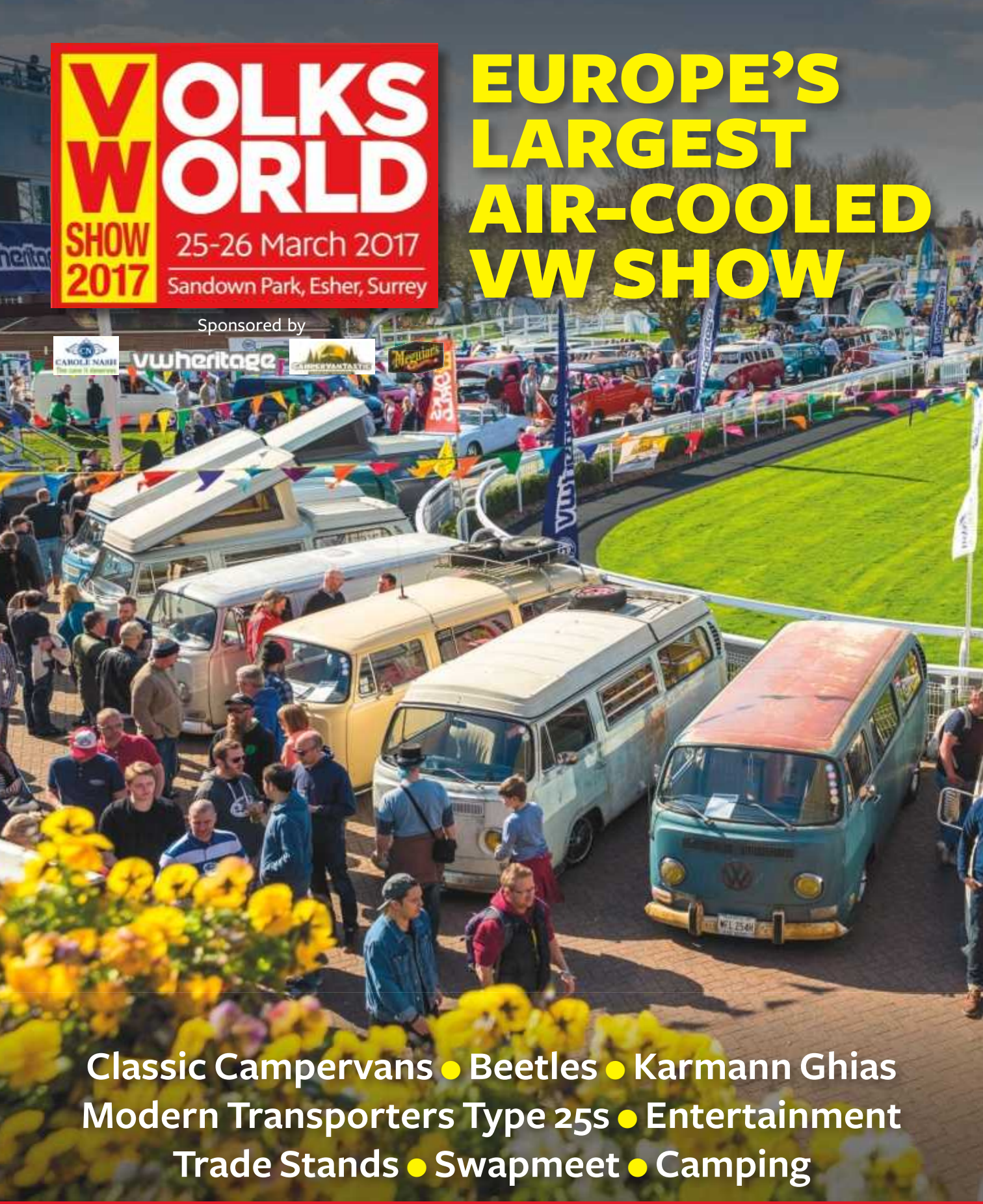
While we did not have the opportunity to test drive either of the Beetles shown here, television presenter and actor, Robert Llewellyn, (*Red Dwarf*, *Scrapheap Challenge*, *Carpool*) did for the weekly broadcast *Fully Charged* show on YouTube (youtube.com/user/fullychargedshow). Robert usually test drives modern electric vehicles, so ECC's Beetle was completely different, but it's clear he has an affinity with the Beetle, and with VWs in general, from the off, and is extremely impressed with its capability, concluding, "It's an amazing, amazing car, I absolutely loved driving it."

Watching the video, it's clear the simplicity of driving this electric Beetle was another definite plus point. Third gear is sufficient for most driving conditions, fourth on motorways and the like, but should you not wish to lose the driving experience completely, you can still switch to Power mode and use the clutch to go up and down through the gears as normal, which is an unusual, and appealing, attribute for an electric car. ■

COSTS AND CONTACTS

Electric Classic Cars (ECC)
www.electricclassiccars.co.uk
Tel. 03331 010029
Beetle conversion kit: from £18,995
Drive-in, drive-out conversion: from £22,995

EV West (USA)
www.evwest.com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S00229

German quality push button handle gasket set 64-68

S29913

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B39938

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S17882

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S00129

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S00608

German quality rear light seals Sold as a Pair 62-7/71

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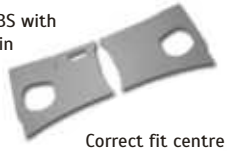
German quality number plate light unit 8/71-79



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Topsy turvey

What happens when a lifelong water-cooled VW owner decides to try his hand at an air cooled

Words and photos Jon Cass

FMA133F

Alloy sun visor is a popular choice in Australia where the intense sun warrants it, but it certainly gives a different look to a car over here

Allstate swamp cooler hadn't seen the light of day since 1968, and even came in its original box. Perfect for blasting cold air at your passenger's right ear!

No one can argue that air-cooled VWs catch your eye when you're out and about, but then there are some you really can't fail to miss, even if you're not a car fanatic at all, and Rob Turvey's bright red and white '68 Squareback is definitely one of those.

Even at major shows, this is one of those cars that draws you in from a distance. You just need to take a closer look to satisfy your curiosity, if nothing else! "People of all ages come over to say how much they love the car. It's quite staggering really," Rob reports. Winning the People's Choice trophy at Leeds VW Festival, Best Cal Look at Tatton Park and Sponsor's Choice at Weston Park last year tells us this a very popular car on the show scene at the moment.

So what was it that tempted Rob into Squareback ownership in the first place? "I'd had loads of VWs over the last decade, but all of them had been water cooled and I really fancied the idea of an air-cooled one for a change," he explains. "I'm more a pictures person and, whilst trawling through the classifieds, the shape of this Variant just grabbed me. It's so different and perfectly proportioned."

Fire in the hole

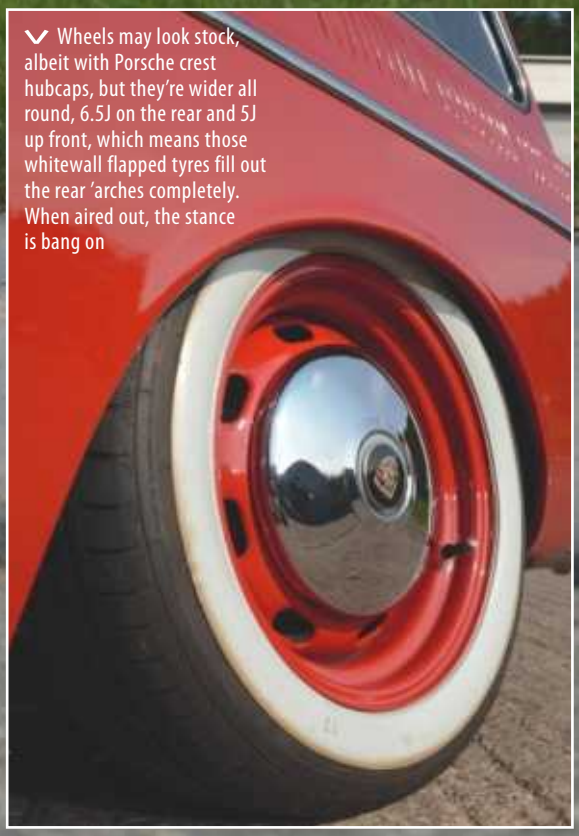
Yet the opportunity for Rob to actually buy the Squareback almost never happened. "I was about to contact the vendor, but then we had a fire at our cottage, so everything car-related was put on the back burner for a while," Rob remembers. "Once the cottage was under repair – we were living temporarily in a static caravan at the time – I began to trawl the classifieds once again, but the advert for the Squareback had now disappeared." Assuming he'd missed out, Rob mentioned the situation to the rest of the family. "My wife, Alison, then told our son that if I could find the car, I could buy it. That was enough for me, so the search was back on."

Bizarrely, Rob managed to trace the vendor via an advert for a gear knob he'd placed, and subsequently made contact. "He told me the car hadn't sold, he'd just removed the advert so, if I wanted to come

"Pretty much all the cars I've owned, I've made a few alterations to take them further along their life's journey"

Being an ex-Californian car, the chrome trim is all still in lovely condition. Clear indicators up front and mesh headlamp covers are subtle changes

SO-CAL Speed Shop number plate surrounds and US-style number plates add to the Stateside feel



Wheels may look stock, albeit with Porsche crest hubcaps, but they're wider all round, 6.5J on the rear and 5J up front, which means those whitewall flapped tyres fill out the rear 'arches completely. When aired out, the stance is bang on

TECH INFO

BODY

1968 Type 3 Squareback, externally repainted in red with a white roof; period roof rack; alloy sun visor; Allstate swamp cooler; clear repeaters; all red tail lights; mesh headlamp covers; US-style number plates

INTERIOR

Stock seats re-trimmed; beaded seat covers; bolster cushions made from carpet roll tube and covered to match seats; square weave carpets with shag pile floor mats; oddments basket; parcel shelf; Gene Berg shifter; Ajax Executive radio; Grant Classic Nostalgia steering wheel

and take a look, he'd still be willing to sell it," Rob explains. "The following weekend I travelled 180 miles to Norwich, did the deal and drove it home there and then."

The Type 3 had obviously already struck a chord with Rob in its acquired guise, but that didn't stop him from wanting to put his own mark on it. "I don't know a great deal about the history of the car, but I know it was imported from California around 10 years ago and some of the Californian sand remains in the car now," he laughs. "It was already lowered on static suspension and drove okay, but the 1600cc engine needed some fettling to get it running right. Pretty much all the cars I've owned, I've made a few alterations to take them further along their life's journey."

Rob's first job once the Variant was back at base was to ensure the engine was running correctly. This meant going through the car's wiring and swapping the worn stock carbs for a pair of new 34ICT Webers. An electric fuel pump was also fitted and his local Powerflow exhaust

^ Stock seats have been re-trimmed and beaded seat covers added. Note the additional bolster cushions in the rear

< Original sloppy shifter has given way to a more positive Gene Berg version

centre called upon for a new exhaust. However, with no heat exchangers or heater in the car, Rob says it's definitely for summer use only now.

In the weeds

Although the static lowered suspension provided a pretty cool stance, Rob says the ride was quite firm and unforgiving. "So I made the decision to switch to air shocks to make it more practical for regular use, and so I can drop it into the weeds at shows." The car now has a four-inch narrowed Type 1 front beam conversion with strengthened end plates from Type 3 Detectives, while at the rear the suspension has been dropped three splines. Limebug provided the air shocks used on the front, and the air tank sits conveniently behind the spare wheel in the carpeted under-bonnet load area. The end result is a neatly cambered stance, even when the car is raised for everyday driving. "I run the front shocks at 110psi and had the tracking set with the car at that height. It rides much smoother now than it did on the low static suspension. Plus I don't need to divert away from speed humps now, which is a huge bonus," says Rob with a grin.

Rather than swap the steel wheels for aftermarket alloys, which would have been a tempting direction to take, a set of 4-bolt steel rims – 5J at the front and subtly wider 6.5J at the rear – have been brightened up by adding chrome Porsche crest hubcaps and a set of whitewall flaps. This combination adds a pure retro Californian look, giving the impression of a late '50's ride to anyone not in the know.

Having originated from a sunny and dry climate, the Variant's bodywork has fared well, considering its age. The chrome all still polishes up well and the bright red repaint, combined with a white roof, does a great job of showing off the Type 3's lines. The roof of the car is also home to some of Rob's chosen accessories, such as the Allstate swamp cooler, located on the passenger side, and the alloy sun visor. Rob sourced the cooler from Arizona, and apparently it hadn't been fitted to a car since 1968. It even came in its original box. "The roof rack is also quite rare as it was only in production for one year," Rob points out, and this is often used for carrying a surfboard, which looks right at home on VW's only long-roofed car.

Once you step inside, the re-trimmed stock seats, complete with beaded 'taxi' covers and bolster cushions in the back, immediately grab your focus, while the deep shag pile carpet overlays are an unexpected touch, but no doubt pleasing underfoot. And that simple, three-binnacle dash is just pure perfection. As you've probably noticed by now, Rob likes his added extras, so a small oddment basket now sits in place on the tunnel, a parcel shelf under the dash and a Gene Berg shifter replaces the original piece. In the rear luggage area, there's a period travel case and mounted inside one of the rear side windows, a scale model of the Squareback, which never fails to attract comments from passers-by.

Inner space

Despite having its engine located at the rear of the car, the Squareback is a deceptively spacious estate. VW cleverly re-located the engine cooling fan on the end of the crankshaft, instead of on the generator, which cut the

TECH INFO

ENGINE
Stock 1600cc twin-port 'pancake' motor; twin Weber 34ICT carbs; electric fuel pump; Powerflow stainless steel exhaust

SUSPENSION
T3D 4-inch narrowed Type 1 beam conversion (with strengthened end plates); Limebug front air shocks; three spline drop at the rear; stock 4-bolt disc / drum brakes

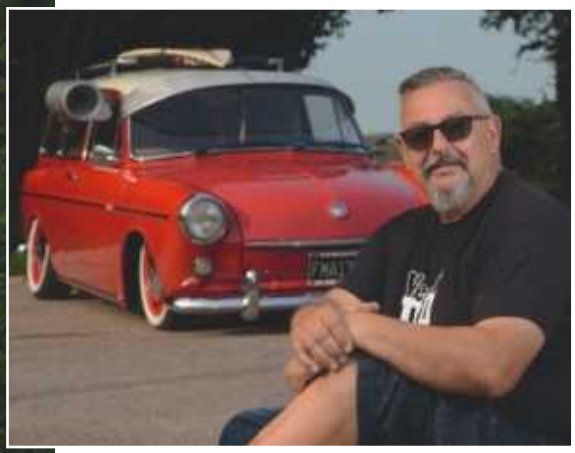
WHEELS AND TYRES
5J 4-bolt steels (front); 6.5J rear, colour coded red with Atlas whitewall flaps on Nankang 145/65/15 and 175/65/15 tyres; Porsche crest hubcaps

> The Type 3 cockpit is a great looking piece of design, but here it's enhanced by a Grant Classic Nostalgia wheel, air ride control panel and Gene Berg short throw shifter

"It rides much smoother now than it did on the low static suspension"

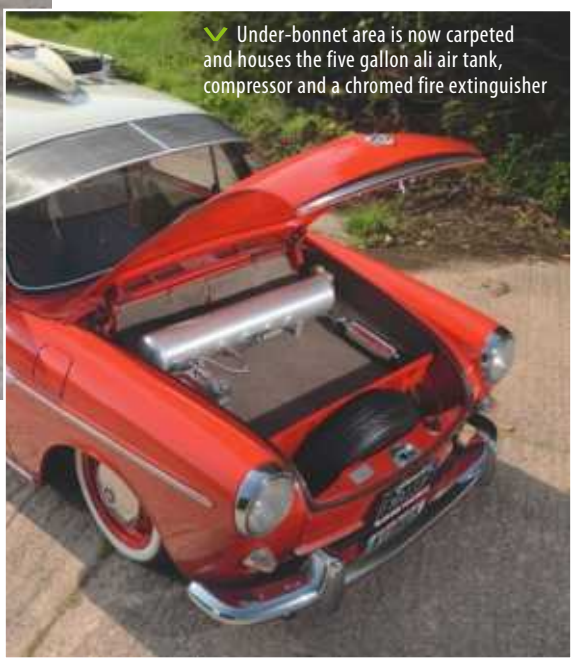
> Neat Jada scale model of the Squareback is mounted on a bracket inside Rob's 1:1 scale version

^ Ajax Executive solid state radio is about as simple as they come



"You don't have to spend bags of money, you can create a cool car at any level"

1600 twin port now has Weber 34ICT carbs with low profile filters in place of the leaky original Solexes. If you're wondering why that fuel pump isn't connected, it's because the car now has an electric one instead



Under-bonnet area is now carpeted and houses the five gallon ali air tank, compressor and a chromed fire extinguisher

height of the engine in half, meaning the whole lot sits beneath the load area floor. With no engine or gearbox to take up the extra space under the bonnet (air tank, compressor and fire extinguisher excepted in this case) the Type 3 Squareback was a pretty handy load lugger, offering both space and practicality, albeit in a two-door only format.

And that extra space often comes in handy as Rob is keen to cram in as many shows as his turfing business allows, so being able to carry all the essentials in the back is a huge bonus. The rewards for Rob's efforts come from the favourable comments he receives at shows, or indeed just taking the Variant for a quick spin, yet he hasn't had to spend a fortune to achieve this. "You don't have to spend bags of money, you can create a cool car at any level, and the car becomes distinctive and individual to you. It's like giving a car a personality," he explains.

"I've met and developed a great group of friends through owning and building this car, all of whom are like-minded people."

With the Squareback now completed, thoughts of his next project are already in mind. "It's likely to be a track car, something built for speed and handling," Rob smiles. Sounds fun, and a world away from this Squareback which, let's face it, is anything but a speed and handling machine, but whether it will raise a smile from everyone who sees it in the same way his Variant does could be another matter.

Thanks
Max Edwards at EVA Restorations; Mark Wrigley for allowing me to buy the car from him (I know he loved the car); Limebug for the air ride, Mick Arnold, but most of all my wife, Alison, for always backing me up and helping me.

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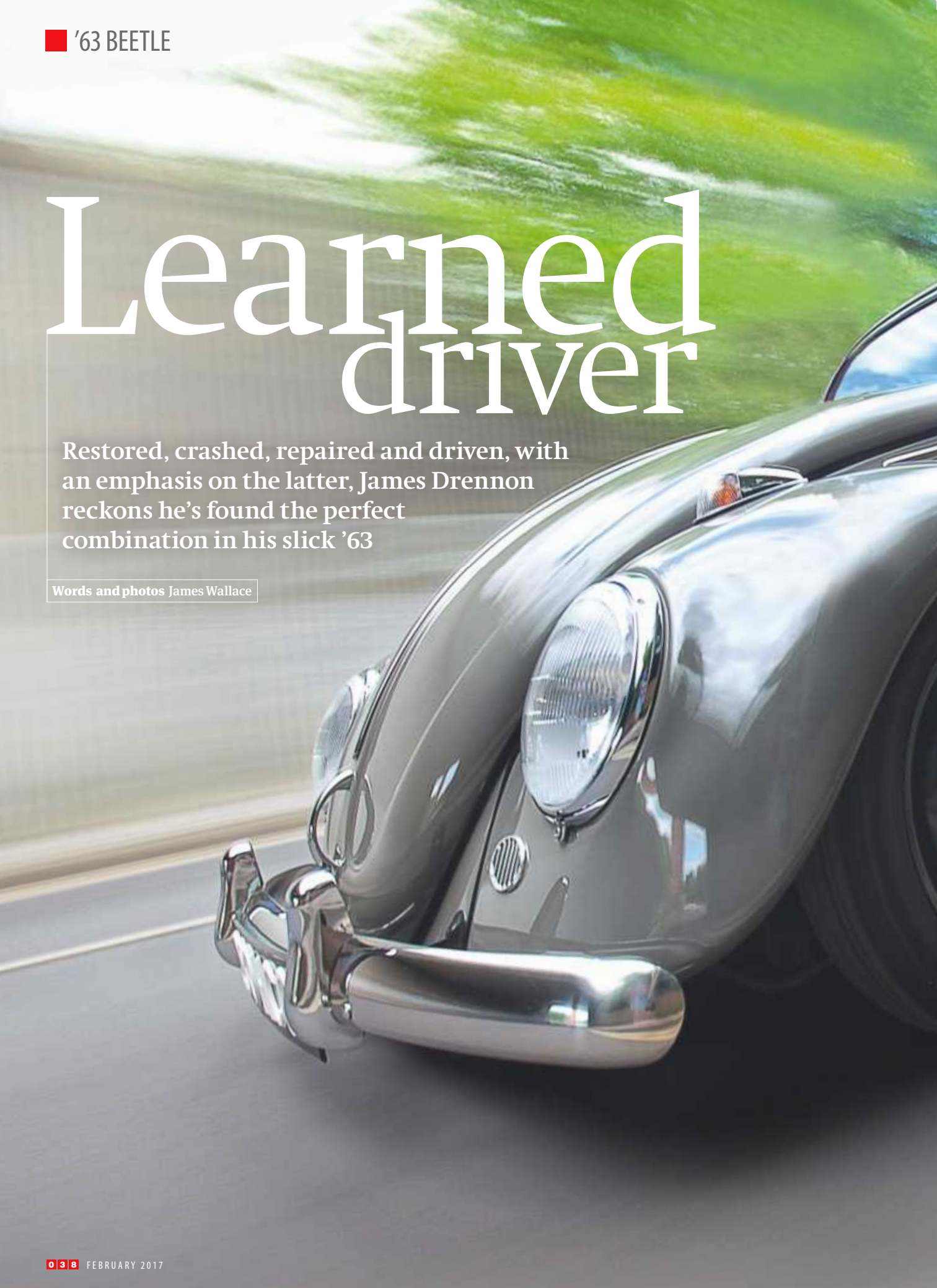
Learned driver

Restored, crashed, repaired and driven, with an emphasis on the latter, James Drennon reckons he's found the perfect combination in his slick '63

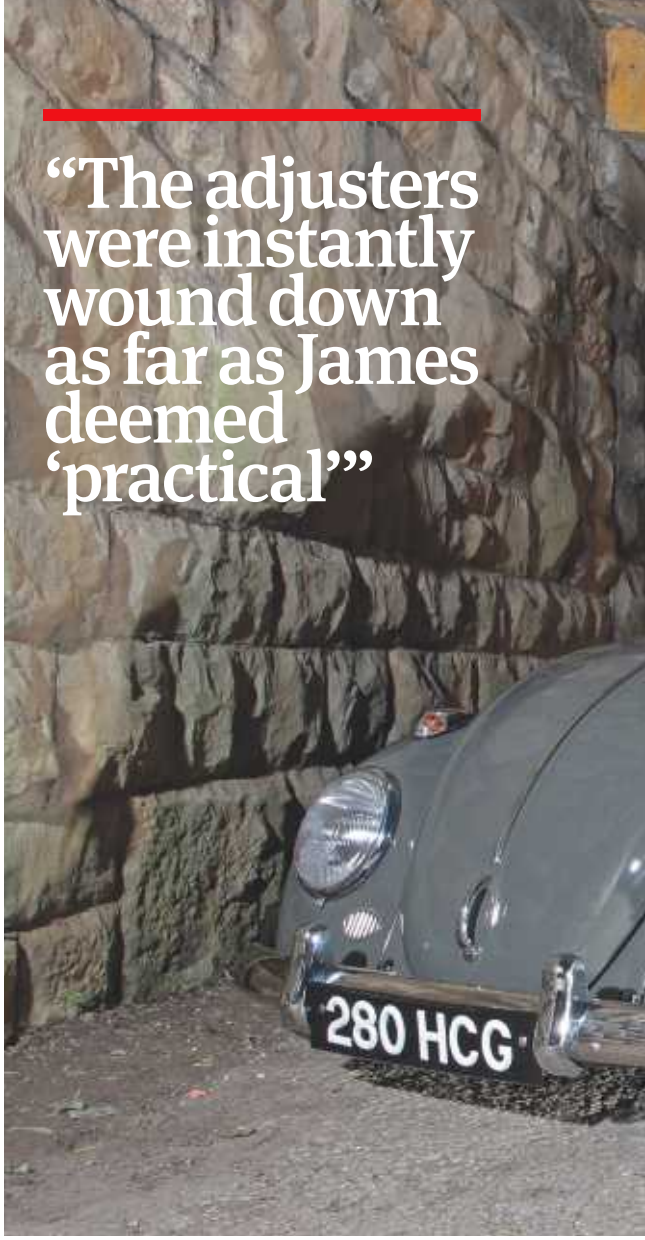
Words and photos James Wallace



Being part of a clique sometimes has negative connotations, conjuring up images of elitism and segregation, but not Clique 53. This group of free-spirited, Midlands likely lads and lasses couldn't be friendlier and more open if they tried. There's none of the usual club politics, they don't all huddle together around the campfire sniping at other people after a few beers because they really don't need to. What they do is share good times, embrace enthusiasm and always, always have a good laugh together. If you attended this year's VW Festival at Harewood House, just outside Leeds, then no doubt you'll have witnessed their easy-going antics, and perhaps even chatted to this rag tag bunch of mates who were there showing off the diversity of their automotive tastes. If our reception was anything to go by, you'll have been made welcome from the off.

^ It's sanitary in here, too. As part of the re-spray process, everything was removed, cleaned, painted, preened and detailed for a super tidy look. BBT Sprint Star spare harks back to the car's previous set of rollers

> There's no tunnel vision here, the Clique53 mantra is all about inclusion rather than exclusion, so if you get a chance to stop and chat with James and the lads at a show, we'd highly recommend you do so



"The adjusters were instantly wound down as far as James deemed 'practical'"

^ Stock steels on the front run on the ever popular Smart Car 135/70 x 15s, with more width and more meat out back. Notice the subtly different shade of grey on the wheels, the early big logo hubcaps and the clever use of red (not pink as it appears here) rim trims between the two

As they're largely based around Mansfield, they're regulars at meets across the Midlands, but also regularly travel much further afield, and have recently set up their own gatherings, in association with the Deadhaus crew. The super-chilled ethos that pervades this lot is refreshing, to say the least, and if James Drennon were any more laid back he'd be horizontal.

Greydream believer

We got to know this collective through a sprayer contact called Kev Hall, formerly of Voodoo Paintworx bodyshop. A few of them also popped along to The *VolksWorld* Show and we got chatting to them there. Back then, this car was running on BBT Sprint Stars, 42-year-old James having owned it since 2009 when he set out to re-kindle his desire for air-cooled motoring after dabbling in the mid-'90s with a '67 Beetle. "I went to the first ever *VolksWorld* Show with my dad in his brand new 1992 Ford Granada Scorpio, and shortly after I bought my '67. I had it for a few years, but had to part with it to muster a deposit for a house," he recalls wistfully.

In James' hierarchy of cool, though, the later model Bug wouldn't cut the mustard these days. "To my mind, there's always been a gold, silver and bronze medal order to Beetle ownership. A '51 or '52 crotch cooler Split is obviously a gold, an Oval comes in silver and then a '58-'64 takes the bronze podium position for me." So with that in mind, James knew exactly what he was after, and had a sensible budget in mind to achieve that. "I set my mind to finding the best 'bronze' car I could. I bought the '63 from a family down in Dorset who were emigrating to Australia. It had been painted 15 years prior using lead-based paint and the chrome was way beyond economic repair as it had spent all that time by the sea. The floorpan was in amazing condition, though, and it was worth the £3,500 for that alone," James explains. "It had a little bit of rot around the bonnet edges, in the spare wheel well and around the steering box, but other than that it was coated in about four centimetres of grease and wax underneath. There was so much I couldn't even see the bolts that held the beam to the framehead. It was as if it had been protected so it could be neglected, if you know what I mean? The lady who owned it used it every day to take her kids to school."

Such sentimental attachment meant the lady didn't really want to sell it, so the price was non-negotiable. "I'm pretty sure she'd have taken it to Australia if she could have, but I kept thinking to myself, if I don't buy that car, some other bugger will get it." So, following a day of reflection, he was on the 'phone and sorting out a one way train ticket back down south to pick it up. "It didn't miss a beat all the way home as it chugged back up north," he remembers fondly. And having had a chance to look over it more thoroughly at his leisure, he decided he was more than happy

with what he'd bought – a car with plenty of potential that needed very little to be a respectable and reliable daily driver.

At the end of the grey

First on the agenda was a deft whack with the lowering stick to alter both altitude and attitude. A two-inch narrowed and adjustable beam was drafted in from Cool Air and, despite James' initial reaction that he "didn't want it too low," that changed as soon as it was bolted on, along with some 2.5-inch dropped spindles. The adjusters were instantly wound down as far as James deemed 'practical' that night by torchlight, and then he felt he had no choice but to match things up out back using some adjustable spring plates and a single outer spline twist to level the car out. It now glides along effortlessly on some shorter KYB GR2 shocks and a combination of 135/70 and 205/60 Continental Eco Contacts. Considering the mileage James has put on the car since taking ownership, it's safe to say he's happy with the overall stance and useability of his pride and joy.

"It was as if it had been protected, so it could be neglected"

Some new chrome parts from Status VW did their best to bring back the bling that had been lost to the elements, but all the while James had a plan in mind to really bring the old '63 kicking and screaming into this decade. "I had to save for ages for the full re-spray, but when I met Kev H I knew he was the man for the job." A reaction between the original factory paint and the lead-based repaint meant paint was lifting in places, so the only option was to strip the whole body back to bare metal. "Looking back on it now," continues James, "perhaps I should have had it media blasted, or even dipped, but I was really worried I'd end up with a bag of dust. Besides, it was never meant to be a show winner. I just wanted a nice, useable car at the end of the day." We can't help thinking he's being a little self-effacing, as the car has received plenty of recognition since being completed. But, like every project, it's still some way from being complete in James' eyes.

Greylight saving

Before the last of the original paint was removed, James had it scanned with a special paint camera to determine the exact mix for the L469 Anthracite.

TECH INFO

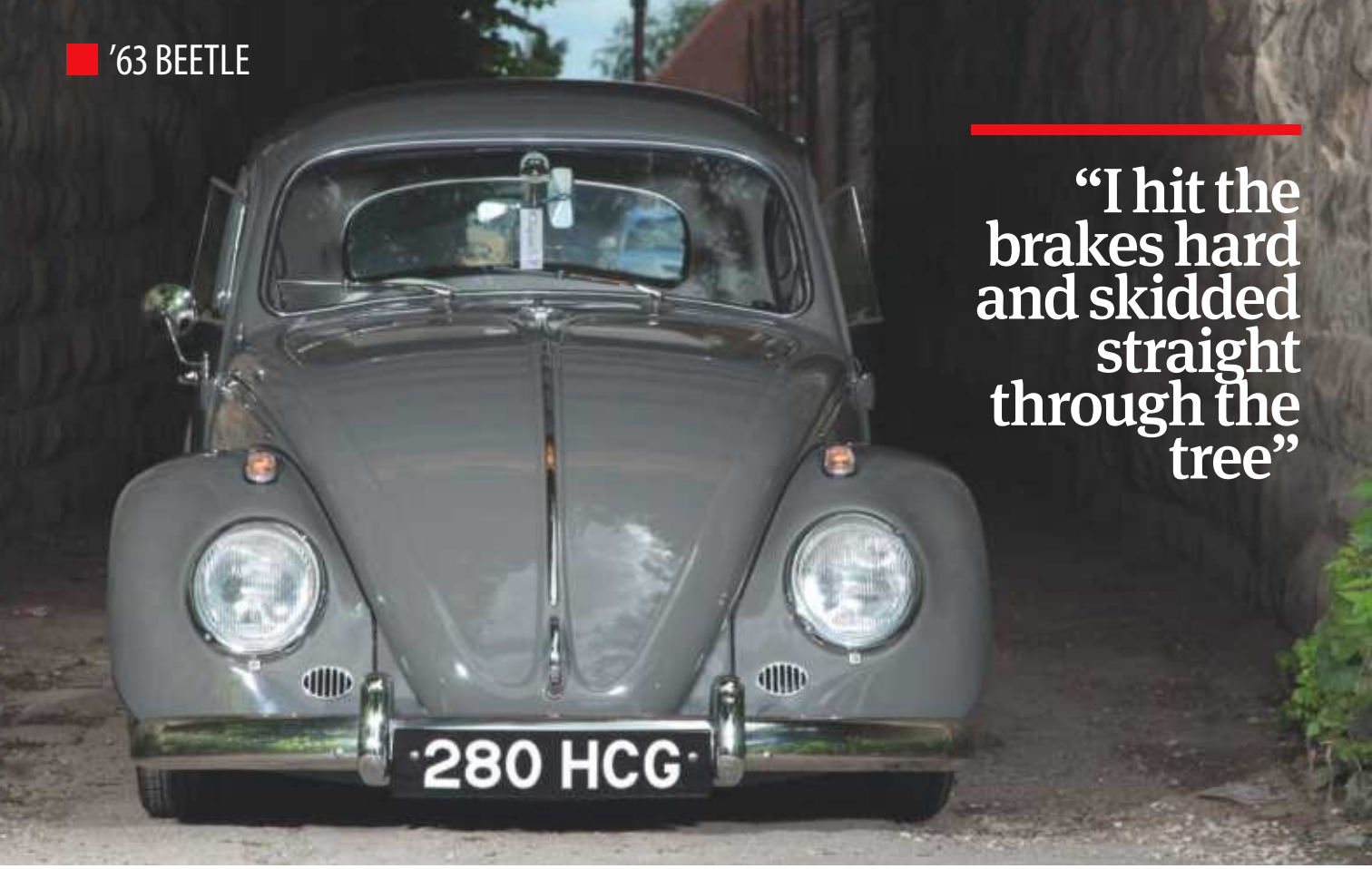
BODY
1963 1200 Deluxe, repainted in L469 Anthracite

INTERIOR
Custom, Classic & Retro re-trim in bitter chocolate vinyl, grey square weave carpet with matching edging and new wool headlining; restored stock D-ring steering wheel; German driving school twin rear view mirror; perforated parcel shelf with stealth ICE

ENGINE
Stock 1200cc 40 horse, factory detailed; alternator conversion

SUSPENSION
Cool Air two-inch narrowed, adjustable beam; dropped spindles; adjustable spring plates; one outer spline twist; refurbished drum brakes

WHEELS AND TYRES
Stock 15-inch Beetle steels, rears banded by Alonze Custom to 6.5in; 135/70 and 205/60 Conti EcoContacts



"I hit the brakes hard and skidded straight through the tree"

With that sorted, prepping it for repainting could begin. Sort of. "I made the mistake of telling Kev there was no rush, and I now know you should never tell a painter that!" says James with a grin. But 51 weeks later, the car emerged looking amazing, and besides, the time spent waiting gave James an opportunity to save up for the interior re-trim.

The results speak for themselves as the repaint was done five years ago now and it still looks fresh, swirl free and immaculately maintained.

But then disaster struck. "Leaving VW Festival in 2014, we were all driving away from the show when a tree fell across the road about six feet in front of me. There was no way I could stop, so I hit the brakes hard and skidded straight through the tree. The noise inside the car was horrifying as there was no real interior in it at that point. I was lucky really, as I got out of the car unscathed to inspect the damage. Bonnet, roof, offside wing, headlight, indicator, bumper – they all looked totalled. I struggled to drive home after that as I kept thinking about how bad it could've been.

Once home, I hugged my wife and son so hard, it was a really emotional experience for me."

Never a grey day

Two weeks later, after sulking a bit, he wheeled the car out of the garage and realised it was nowhere near as bad as he had first thought. Fears that the roof might be creased were soon put to rest, and most of the damage was able to be dent-mastered out. In the end, the only panel that needed replacing was the front valance, plus a little bit of fresh paint, and James was soon back on the road.

Talking of which, the stock 1200cc engine remains in the engine bay. "I'd never mess around with an air-cooled motor that's running well," muses James. "I've got loads of mates who have dicked about with their engines, and their cars are hardly ever on the road.

"If I were to do anything, I'd just go for a freshly rebuilt, nicely detailed 1500, but I've done so many miles this year that there's no need to do anything with this engine, it just works." So, aside from a new vacuum advance dizzy, some freshly painted tinware and a nice bit of detailing to keep things sanitary, James is more than happy to zip along to all the shows in this 40bhp workhorse. Well, you know what they say about if it ain't broke, right?

The final chapter of this story comes in James' desire for interior perfection. He'll never admit it because he's too modest, but the interior is truly beautiful. Having enlisted the help of Vaughan Green at Custom, Classic & Retro near Loughborough, the brief was simple: "I wanted it to look stock, but with a twist," James explains. "And he absolutely nailed it for me." The bitter chocolate vinyl contrasts perfectly with the light grey square weave carpets, while a brand new headlining brightens things up inside immensely. James's favourite touch, though, has to be the 'learner

^ There's no sign of the front-end damage that occurred when a tree fell in James' path in 2014. Damage looked bad at the time, but it turned out to be largely cosmetic

v The stock, oil tight and healthy 1200 that the car arrived with remains in the engine bay. Why mess with it if it's working well?

Not being a trinket pimp, James' car is devoid of unnecessary additions, though the one piece he made an exception for is the German driving instructor twin rear view mirror he found at a swapmeet. It's a conversation piece alright

Basic, but classy. James had to save up for the perfect interior, but Vaughan Green at Custom, Classic & Retro did him proud. He wanted stock with a twist, and that's exactly what he got. Lovely, isn't it?

driver' twin rear view mirror. "I'm not a trinket pimp," he says, "but I love the German driving school mirror. Everyone talks to me about it."

Earl grey

The eagle eyed amongst you will also notice the vented parcel shelf that allows for a stealth stereo install – no cutting or butchering of unnecessary holes anywhere in here – that comprises a Kenwood head unit, a pair of 6 x 9s and a 10-inch subwoofer, all powered by a single four-channel amplifier. James feeds the head unit tunes via the power of Bluetooth from his 'phone, and the power behind the sound is genuinely surprising, and makes a neat and effective way to ease those motorway miles.

"the interior is truly beautiful"

He may have started off on a set of Sprint Stars, but James is now rolling on a set of Alonze Custom (see www.alonzecustom.co.uk) banded steels (6.5-inches wide out back, stock up front) adorned in a contrasting grey hue and finished off with some stock hubcaps and neat red rim sealing detail. Personally, we think we preferred it on the Sprint Stars, but it's not our car, and a change is as good as a rest.

When we spoke to James at the start of October, he was just on his way out to a Sunday BBQ meet with his club mates, but he found time to speak with us for this feature and, apart from the tree incident, he made everything involved with this build sound effortless. However, we know full well what it takes to pound the miles and keep on top of a car like this, and for that reason alone, we doth our caps to Mr. Drennon, and hope we continue to see him and this car out and about at shows and meets for many more years to come. But hold on, what's that you say James? Air ride? ■

Buff daddy Drennon loves a detailing product. Rather than smelling of old gearbox oil, his travelling kit bag has a range of sweet smelling products inside, and we're not talking pomade

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Australian car enthusiast, Jim Gibson, tells us of a rare Puma, believed to be the only one to have prowled the 'Land Down Under'

Words and photos Jim Gibson

It was the mid-'80s and I was searching for a sports car restoration project, but no ordinary classic, something special that would capture the imagination of the collector car devotees. And there it was, an advertisement in the October 1985 issue of *Unique Cars* magazine. It was succinctly written: "Puma GT (1973) sports car", together with a black and white photograph, and an Adelaide 'phone number. I busied myself researching a 1973 Puma, and found it was Volkswagen based, with an attractive GRP body, and factory assembled in Brazil. I had been involved in Formula Vee racing and therefore had fettled Ferdinand Porsche's brilliant air-cooled flat four, along with its associated running gear. So, with that knowledge behind me, as well as the fact I wouldn't need a panel beater, or need to eradicate rust from the glass fibre body, I dialled the number and was on the following day's flight from Sydney to Adelaide.

When I got there, I couldn't believe my eyes. The sculptured body was reminiscent of a Ferrari 275 GTB, but cast a much smaller shadow, being only 44in (110mm) from tarmac to rooftop. A deal was done and, after fuelling up, checking the lights, tyres pressures (there wasn't a spare) and engine oil, I set out on the 870-mile journey back to Sydney, in a strange car I knew nothing about. By the time I reached Balranald, the daylight was starting to fade and the shadows lengthening. This town marked the start of the Hay Plains – some 185 miles in an easterly direction on a ribbon of straight bitumen.

With darkness upon us, I discovered high beam was no better than candle power. The headlights of interstate trucks would peer over the top of the Puma as they approached from behind, before they scurried by, me eyeballing their wheel nuts. Each time it happened, I worried one of these juggernauts would cast a stone hitting the Puma head-etched windscreen. Having made it through the night unscathed, daylight greeted us in the town of Narrandera, at the end of the Plains. It was time for breakfast and a coffee, then an easy daylight run north to Sydney.

Salient points

With the beautiful little car safely tucked away in my garage and the teardown underway, I set out to find just what I had bought, what its bloodline was, and how it had strayed into Adelaide. Research proved time consuming and fun but, as Ivan McCutcheon's article in the August issue of *VolksWorld* covered much of the provenance of Puma, I will only touch briefly on some of the salient points to do with my own car.

The company founder, Rino Malzoni, was an Italian who'd emigrated to Brazil with his family when he was eight years old. They settled in São Paulo, where he later became a successful lawyer, but he always had a burning ambition to construct his own sports car. Looking at this car, you can see Malzoni's Italian heritage inspired much of its design. In traditional Italian manner, the female mould for the body was hand-beaten steel.

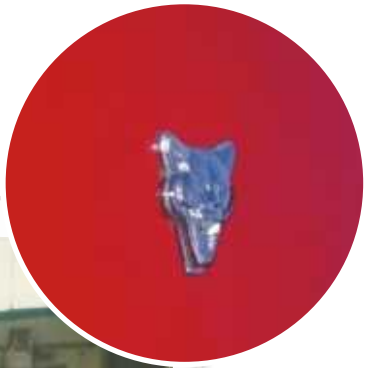
The rolling chassis came direct from the VW factory, and were then shortened by 10 inches

^ In the car's first rebuild, it was painted Porsche Guards Red, but an accident forced a second, more comprehensive rebuild, and a change of colour, too

"I set out on the 870-mile journey back to Sydney, in a strange car I knew nothing about"

^ Brazilian flag by the nearside shark gill air intake

v Chromed metal Puma badge I had made locally



10-inch cut 'n' shut in the floorpan, done at the Puma Cars factory

Stripped ready for rubbing back and new paintwork

(250mm). This concerned me a little as the New South Wales Department of Transport may not approve of the chassis being welded, even though the car had already been registered in South Australia (back then, each state had its own regulations). However, when it came time for registration, it passed with flying colours, weighing in at 750kg, with a 40 / 60 weight distribution, biased to the rear.

So just how did it get to Adelaide in 1973? Turns out an Adelaide-based classic car sales company imported just one car – my car. The company's intention was to import them in either Completely Built Up (CBU) or in Knock Down (CKD) form and market them in Australia. However, with the onslaught of new Australian Design Rules (ADRs) and the frustration of dealing with Brazil in the early '70s on a commercial

basis – lost letters, pilfered stamps, language barrier etc. – it all became too difficult. As a result, I believe my factory right-hand-drive car (chassis no. 1432318 / production no.1447) was the only one imported, and passed through several owners in the 12 years before it came into my tenure.

Chassis number stamped in the floorpan

Missing links

Back in the workshop, a broad-brush diagnosis of the patient was carried out. It needed some glass fibre patchwork, some badges, an engine – the original, along with its twin Solex carburettors, had long departed its nesting place in the stern – new upholstery (South American interior decorating is not my favourite decor), a paint job and the horn push from the centre of the steering wheel. However, guess what I found under the carpet? Although only a Puma head embossed horn button, it was treasure to me.

On the upside, I couldn't believe how well the doors fitted and closed, with no undue movement in the hinge area, a place prone to problems in a five-year-old GRP car, let alone one 12 years old. I remember reading somewhere in the mountain of facts and figures I'd gathered about Puma Cars that two thicknesses of GRP were used – a thinner gauge for the locals.

The build quality and the thought behind this small Brazilian sports car were quite outstanding. The more of its finery I removed, the closer I felt to the soul of its maker.

The greatest fun was the challenge of locating its missing parts, which spaned two continents, from South Africa (Pumas were built in Pretoria under licence) to South America. No, in fact it was three, as the uncanniest find was right here in Sydney. You see, it was missing one headlight trim. This at first appeared to be a simple chromed section of sheet metal, something one might find on any older car in a breaker's yard, but it wasn't that simple. After visiting countless yards in vain, it was looking as though a local sheet metal worker would get the job of replicating the part. But as I was passing a Jeep and Rambler wrecker, I thought I'd give it one last try, expecting the usual shake of the head after I'd shown the sample. But this time, the fellow said, "Yes, I think I may have one." He rummaged in the back of an old van and there it was, a match for the piece I had in my hand. He'd never seen one before and hadn't a clue what it belonged to. Fate, if you ask me.

Under the dress up is a 1914cc motor with a custom grind cam. Carbs are twin 40mm Kadrons, or Solex H40/44 E1S

Ready to roll

Some five years passed. I'd replaced the engine with a 1914cc firecracker that lifted the valves with a ground cam. With twin Kadron / Solex carbs and an extractor exhaust it looked the part, and sounded good, too. It was painted in Porsche Guards Red and the interior had been refurbished. The alloy wheels were refurbished in silver and shoed with Yokohama 195/60s at the front with 225/50s bringing up the rear. It drove and handled like the real sports car it was, and unlike the uncomfortable driving position reported in *VolksWorld*, at 5ft8½in tall, I found sitting in the right-hand-drive position quite comfortable, albeit awkward at ingress and egress.

I spend an enjoyable few years driving her

The original tail light assemblies were damaged, so I fitted round lights giving it a real Ferrari 275 GTB look. The number plate light is from a Datsun 1600

Puma head centres in the 14 x 6 alloy wheels. Tyres are meaty 195/60s and 225/50s

Interior was refurbished locally in Sydney

Bare floorpan after body removal for the second restoration. Note all the suspension tuning parts have been detailed in red

Now fitted with personal number plates

I sourced the 'Made in Brazil' decal on the rear window from a VW club friend in São Paulo, along with the metal car club badge on the left side of the engine cover

"The more of its finery I removed, the closer I felt to the soul of its maker"

and attending various shows, even winning a few trophies. The interest from the general public and car enthusiasts alike was gratifying.

Disaster strikes

Then one day in 1994, I was stretching the Puma's legs along a winding country road early one Sunday morning, when I entered a left-hand bend and found there wasn't any response from my input on the steering wheel. The car just kept tracking straight, heading for an earth bank on the right hand side of the road. In my mind's eye I could see what was going to happen. Sure enough, the climb up the bank rolled the car and it slid down the road on its roof with me hanging upside down in the seatbelt for a short time, and then flipped back onto its wheels. Thankfully, we were both okay, if a little shaken.

You guessed it, it would be another rebuild, but this time a complete body off exercise. Later inspection showed the splines between the steering box sector shaft and the pitman arm had stripped, hence the road wheels couldn't respond to the steering wheel's input. The car's most valued component, the windscreen, had also broken. Fortunately, I was able to buy a replacement from Puma Cars in South Africa, unfortunately without the Puma head embossed. But wait, there's more. When it arrived it had been broken in transit, so I had them send another, only this time I asked for it to be packed securely for its transcontinental journey.

If I was going the rebuild the car again, I wanted it to at least be a different colour, leading me to subconsciously believe it was another car. So this time it was repainted in GM Chrome Yellow, and that's the colour it is here.

Some years later, my wife and I changed our lifestyle, moving from Sydney's rat race to some acreage in the country, but the dirt roads were not sympathetic to a pristine, low-slung sports car. So, after 15 years of pleasure and pain, the Puma GTE went to a new home, and these days she's soaking up the sunshine in tropical North Queensland. ■

Second time around, clothed in GM Chrome Yellow. Note the Puma GT badges I obtained to fit on the front quarter panels

Memory Lane

Got a VW tale to tell? Email your story to volksworld.ed@kelsey.co.uk

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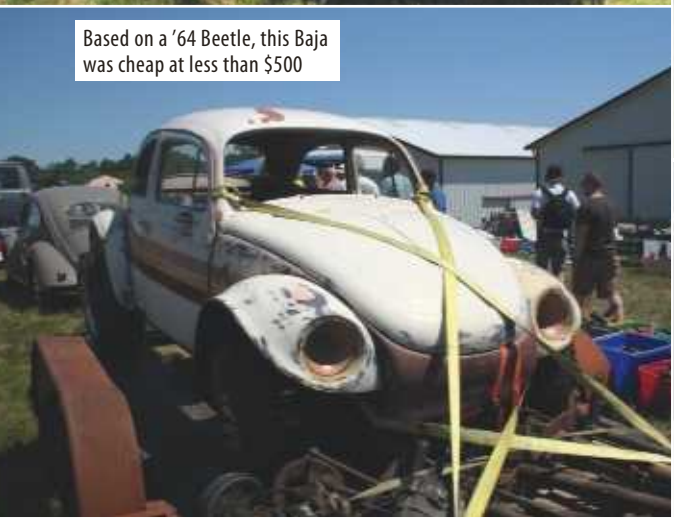
If your Oval is not slow enough, we recommend strapping a trunk to your roofrack. Sideways!

We loved the look, the colour and stance of this '69 Cabrio. It's timeless



Based on a '64 Beetle, this Baja was cheap at less than $500

'66 Karmann Cabriolet rolled on an unusual choice of four-spoke Ronal rims but it worked

Split dash looks even better when you let the sun in. 1950 Split Cabriolet is rarer than a Heb!

The Litchfield Bug-In

While on vacation, our man Cathal took in a VW show at the same time

Words and photos Cathal O'Toole

While visiting family in Boston I thought I'd take the opportunity to experience an American show as it had been a few years since my last one. I got in touch with Stan Wohlfarth, owner of Stan's Classic Service in Natick, near Boston (www.stanagon.com) who recommended I head on over to the Litchfield Bug-In, happening on 19 June in Harwinton, Connecticut. Stan said it was once a much larger show that had fallen off in recent years but thanks to the tireless efforts of the local clubs and the organising committee the 28th annual show was predicted to be the biggest in many years. Stan knows his VWs but he also knows his shows so I took his advice and made my plans.

At just under two hours from my base in Boston it didn't take me long to get there in early Sunday morning traffic. But even as I pulled into the Harwinton Fairgrounds the car park was filling up fast with modern dailies and, of course, air-cooled VWs aplenty which had been driven from Massachusetts, New York and Pennsylvania, Virginia and many more states. If the car park was anything to go by this was going to be a great show.

And it was! Let's face it, any show with sunshine is a novelty for those of us on this side of the puddle so already it had my vote. First stop was the swapmeet area where there were rows upon rows of traders where you could pick up pretty much any part you needed for almost any VW. Most traders were long term collectors so had a stash of goodies on sale and I'm happy to report their prices were fair too. I had to be good though as I had a luggage allowance but I could have easily blown all my pocket money in the swapmeet.

Please yourself

The show and shine was on the other side of the fairgrounds and offered a more relaxed setting with cars lined up on the grass, food stalls to

Litchfield Bug-In

Restored in the 1980s using an assortment of parts from a personal stash, this late bodied '49 Standard Split Beetle was parked in the swapmeet

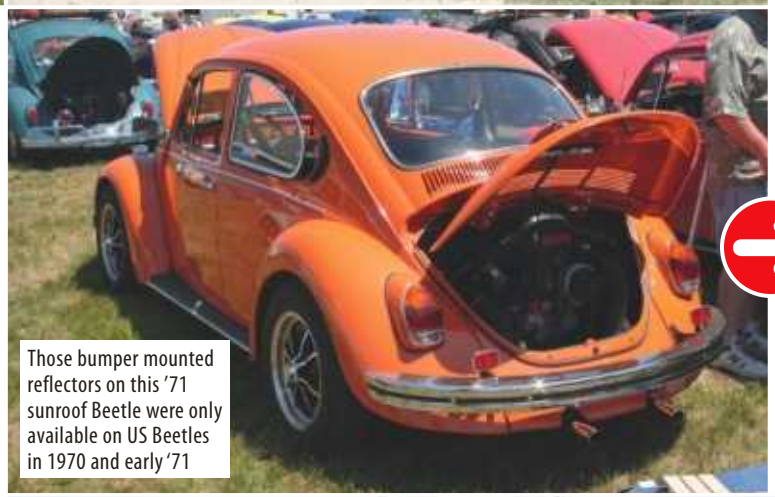
Big tyres and rims make this relatively stock Trekker look aggressive

Word is that early big window Beetles are the next big thing. If this ragtop is anything to go by, we can see why

Java Green '66 1300 had flawless paint. Stinger exhaust? We didn't see that coming!

Late model Karmann Cabriolet was rust free and a steal at only $6,500

> "I could have easily blown all my pocket money in the swapmeet"



Those bumper mounted reflectors on this '71 sunroof Beetle were only available on US Beetles in 1970 and early '71

One of the few proper Rat Look VWs on the day was this understated Split Panel

What else are you going to do when you've no cover on your convertible frame?

Litchfield Bug-In

With colour coded engine, T bars, dechromed body, louvred firewall and eight spoke rims this '70 Beetle screamed 1989!

Ribbed for everyone's pleasure! This Palm Green and Sand Green ribbed bumper Splittie was a thing of beauty

Proving that even with one colour, you can have three very different looks

This Oval was last registered in Massachusetts in 1971, parked in 1972

Proudly wearing its Vintage Volkswagen Club of America badge was this '54 Ragtop with heart taillights

one side, a DJ facing the VWs and fantastic views as a backdrop. It was hard to believe I had left downtown Boston only a few hours before.

What struck me was the quality and varying styles on display. The overall theme was fun and people weren't worried about building to 'scene specs' which was a refreshing change. Yes there were some Rat Look VWs but it was actually nice to see people doing something unique and building their VWs how they wanted rather than how they felt others would want their VW to look.

Karmann rarity

I met with Stan who had his Karmann Cabriolet on display. The roof is, as some ads would say, "in need of some TLC" so a garden brolly did the job of keeping the harsh sun off the interior. I also ran into Bob Cook, owner of Cookers V-Dubs in Maryland, Virginia (www.cookersvdubs.com). We have featured many of Bob's creations over the years in VolksWorld and I'm happy to say we have more coming but the VWs he had on display were mind blowing. How about an original paint Zwitter that was pulled from long term storage? The Beetle had been parked up after many years of reliable service for the family and the intention was to restore it but sadly the owner passed away and it was left untouched for decades. Bob resurrected the Zwitter for the original owner's daughter and it's back motoring again and will see a restoration in the future. The other Split was a fantastically rare 1950 Karmann Cabriolet that Bob recently purchased. With only 2,695 produced in 1950 and less than 50 registered on the Karmann registry, this is a very rare Beetle. What made this three owner Karmann even cooler is that it is totally unrestored and complete. As much as Bob wants to keep it as-is he knows he has to restore it at some stage.

Sunday driver

Another enthusiast with some rare metal on display was Gene Langan. Gene is a great guy who is more than happy to talk to everyone about his cars. He has amassed an amazing collection and despite everyone drooling over his VWs, Gene told me the only examples on display were the ones he doesn't mind people getting up close and personal with so to speak, and I'm including an original paint, original interior, unrestored Split Bus and an all original, unrestored 48,000 mile Ragtop Beetle in that display!

> "What made this three owner Karmann even cooler is that it is totally unrestored"

It was a great show. I met some really cool people and caught up with people I hadn't seen in many years, hung out and enjoyed the VWs in the sun. That's a pretty good Sunday in my books!

Litchfield Bug-In

Called a Super Beetle in the US, this 1971 1302 was fresh from a concours restoration

Late '64 L41 Black Beetle had classic looks thanks to stock steelies, whitewall tyres and roofrack but thanks to this Judson Supercharger, it's anything but stock!

Meyers Manx buggy was show car fresh. Doubt this one sees anything other than trailer action

Bob Cooke brought along this OG paint Zwitter, fresh from its hibernation. Check out the seat covers made by the owner's wife in the 1960s

Would sir like original and unmodified or nose down, dechromed Cal Look style on one's Karmann Ghia?

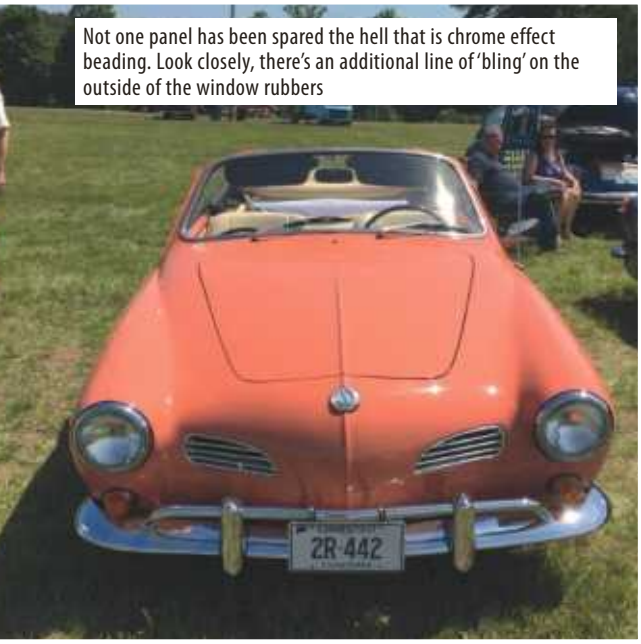
'75 'Faketina' Beetle was a fun VW. Clearcoat lifted the rust

SHOW REPORT
Litchfield Bug-In

One of my favourites. An L633 VW Blue 1967 steel sunroof Beetle

If you've never owned a Trekker, get one. They're so much fun!

Maybe not on everyone's colour pallet but the Italian lines of this mid 60's Ghia can pull it off



Not one panel has been spared the hell that is chrome effect beading. Look closely, there's an additional line of 'bling' on the outside of the window rubbers

Diamond Grey L243 Ragtop looked fresher than it did in '58

Gene Langan's Splittie is 100% original and unrestored. It was last registered way back in 1977

> "people weren't worried about building to 'scene specs'"

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Ready for the rebuild?

We're back at The VW Engine Company for more insider tips to help you rebuild your Volkswagen's engine

Words and photos James Wallace

There are three basic areas rebuilding a flat four VW engine falls into – crankcase, internal moving components and cylinder heads. Having assessed the parts from our 1600 twin-port engine in our December '16 issue, we returned to The VW Engine Company to watch the lads assemble a new engine for Oliver's '67 Beetle.

We're not building a hot VW engine here as Oliver is relatively young and just wants a reliable, insurance-friendly motor in his car. However, having established that his 1500 Beetle had already been upgraded with 1600cc barrels and pistons and twin-port heads, after discussing it with Oliver, the chaps from Catford decided to further upgrade to 1641cc capacity for a few extra horsepower, whilst maintaining the reliability of an essentially stock engine.

Whilst the original crank was too far gone to re-use, after crack testing and visual inspection both cylinder heads were re-usable. The crankcase itself, despite significant end float present when the engine was removed, was checked thoroughly and, as the rear main bearing flange was not past its wear limit, was deemed a suitable candidate for align boring and re-use.

Any engine build is a systematic and precise process, and every experienced engine builder will have their own little tips and tricks gained from years of experience. As some of the processes shown here – notably align boring and crank grinding – are out of the reach of the home mechanic, you should allow for some professional machine work in your budget. Skip these stages and you're really flogging a dead horse, for however carefully you rebuild your engine, if there is excessive side-to-side and / or end-to-end play it will only be a (short) matter of time before you need to do it all again. Okay, let's get started…

ALIGN BORING

We touched on this last time. Often mistakenly referred to as line boring, this is the process of trueing a crankcase by overboring the main crankcase journals a very precise amount. It should be noted that VW does not recommend align boring, but when performed correctly by an expert like Dave here, it's an acceptable way to make a crankcase live another day in a stock or very mildly tuned engine. However, it should only be done using a VW-specific jig and a special cutting tool, and even these are becoming increasingly hard to find these days.

The distributor drive must be removed from the case first, noting (and keeping) the number of shims at the bottom of the shaft, and all swarf meticulously cleaned from the case after.

Once the process is complete, your machine shop will be able to tell you what oversize bearings you require, from 0.020-0.100in (0.5-2.54mm), depending how badly worn, scored or oval the crankcase journals were.

> "If VW decided to fit [case savers], there must have been a reason, right?"

CASE SAVERS

Used on all The VW Engine Company rebuilds and fitted as standard on '71-on engines, these threaded steel inserts (above) can, as the name suggests, save a case where the cylinder head studs have pulled through the softer magnesium alloy material. Even if they have not, The VW Engine Co. recommends installing them to prevent that happening in the future. Hey, if VW decided to fit them, there must have been a reason, right?

Note how close the cylinder head studs are to the cylinder bores in a stock 1600 engine. Overboring for larger diameter barrels and piston brings them closer still to the cylinder walls.

CYLINDER HEADS

While fly cutting cylinder heads (machining an even amount of metal off across the sealing face) has long been done by tuners to raise compression ratio, it is sometimes necessary to do by a very small amount to achieve a perfect seal on a stock engine that is re-using old parts due to the lack of gasket between the heads and barrels in the VW design. A competent machinist will know exactly how much material to remove. Go too far and you risk upsetting valvetrain geometry, as well as increasing compression ratio. The idea is just to skim the mating face to ensure a uniform surface.

RE-FACING VALVES

Another job that should be left to the machine shop is re-facing old valves. If your engine's inlet valves aren't burnt or damaged, they can be cleaned up by cutting a fresh 45-degree angle to suit newly cut valve seats. Due to the extreme heat conditions they operate in, exhaust valves are usually consigned to the bin regardless and The VW Engine Company always fits a new set for peace of mind.

Buy this book

How To Rebuild Your Volkswagen Air-Cooled Engine **by Tom Wilson**
ISBN – 0-89586-225-5

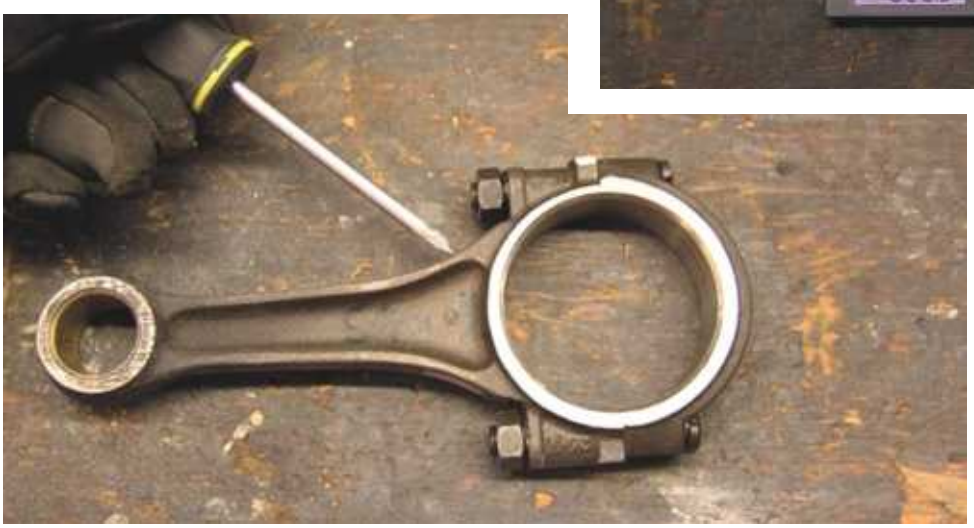
Engine rebuild basics – Part 2

CRANK GRINDING

If the main or big end journals are worn, scored or feature grooves (detectable by running a fingernail across them) it's possible to grind off the tiniest amount of metal to reveal a clean, fresh mating face for the bearings to run on. Dave can set the crank grinder up and remove 0.001in (1 thou, or 0.0254mm) of material. Our original crank was only fit for the bin, so a re-ground one that had been undersized 0.5mm was used in association with 0.5mm oversize main bearings.

BALANCING CON RODS

Official VW tolerance allows for up to 10g difference between rods, which is huge, but The VW Engine Company aims for around 0.5g difference to reduce bearing wear and help the reciprocating assembly spin as freely as possible to maximise engine longevity. This is a job that can be done at home, and material can safely be removed from the area indicated below, notably the cast 'webbing'. It's a good idea to take a little from both sides to keep things even but be sure to go gently, and work to the lightest rod, weighing frequently until you have got each one right.



Crank assembly tips

It's vital the crank is assembled correctly. For the purpose of clarity, if a crank and flywheel assembly is stood on end, the top is referred to as the crank pulley end, the bottom is the flywheel end.

Ensure the front main bearing is fitted on the crank the right way round. The dowel peg should locate down, facing the flywheel end.

The oil slinger ring, main case bearing, distributor drive gear, crank timing gear and front main bearing – in that order – should sit on the top of the crank.

FLYWHEEL GLAND NUT

When assembly is complete, Adrian performs a run-out check to ensure end float is within tolerance before the gland nut is torqued up and the engine is signed off as complete. End float should be between 3-5 thou (0.762-0.127mm) and is measured using a dial indicator. Too little could mean seizure, too much a loose crank that will move about in the case with potentially ruinous consequences. This measurement is set by three shims against the rear thrust bearing that are available in sizes 0.24mm up to 0.38mm. You can mix and match sizes but always use three shims as the middle one rotates. The life of your engine depends upon this, so take your time and get it right.

When re-tightening the infamous flywheel gland nut, you'll need to give it a massive 235-250ft.lbs of torque, using a flywheel lock to prevent the flywheel turning. You'll also probably want a friend to help hold the engine. Check out the enormous torque wrench Adrian uses for this job.

How much?

Exchange 1200cc (D code) turnkey engines with all ancillaries fitted start from £1,536. The VW Engine Company offers a 12-month (24 months if turnkey or fitted by them) warranty on all its engines.

> "it's never a bad idea to upgrade to full flow oiling"

FULL FLOW OIL SYSTEM

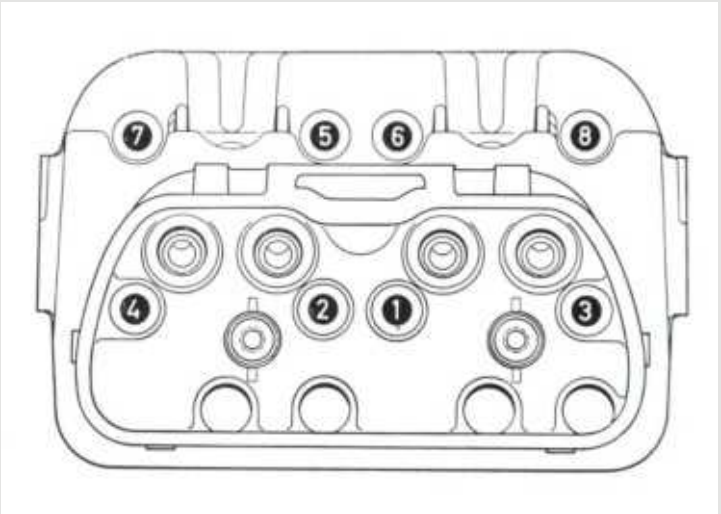
Our crankcase had already been drilled and tapped for full flow oiling and had a take-off plate on the oil pump for an aftermarket, remote oil filter. If you are building a stock engine, the standard gauze oil screen is adequate, but it's never a bad idea to upgrade to full flow oiling. As well as improved lubrication, there will be more oil in your engine (remember, the oil also helps keeps the engine cool) and it will be properly filtered, rather than just running through a coarse tea strainer.

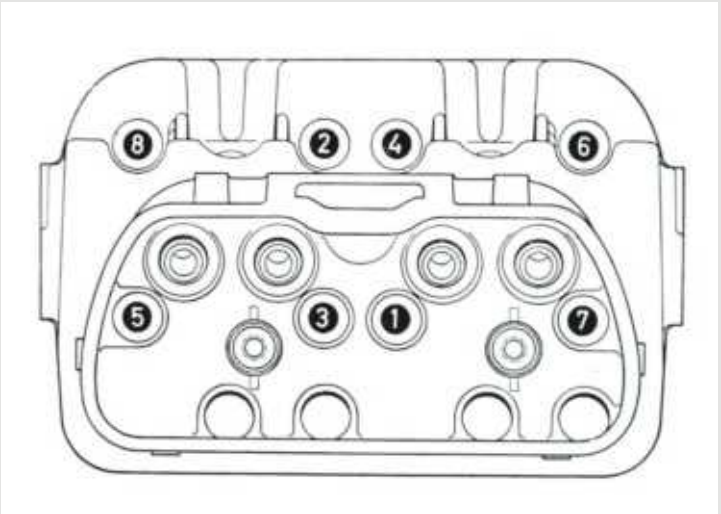
EXPERT ADVICE

Engine rebuild basics – Part 2

Installation tips

- Connecting rods should be tightened on the crank to 25ft.lbs. They should rotate freely but securely, with no snagging as you move them around the crank.
- Don't forget the circlips that secure the gudgeon pins on the pistons. A dab of Graphogen on the small end bush and piston skirt will help lube things up during break in.





- Cylinder head bolts must be torqued in a specific order (see diagrams above). Start by torquing them up to 15ft.lbs in the order noted in the top diagram, then go over them again tightening them to 20ft.lbs and then a final time up to 23ft.lbs, in the order shown in the bottom diagram. When the engine heats up it expands and increases this torque to near 55ft.lbs. Over torque them to begin with and you run the risk of the studs pulling out of the case when the engine comes up to temperature.
- When assembling the cam and crank gears, the big dot on the cam gear should sit between the two dots on the smaller crankshaft timing gear.
- The VW Engine Company recommends always using new cam followers, even if you are re-using the old cam.
- Install pushrod tubes with the seam facing up towards the barrels. This will prevent leaks should they split.
- Finally, we've said it before, and we'll say it again. Don't forget the under cylinder deflector plates. They're the most important part of the engine cooling system after the fan.

Seals and lubes

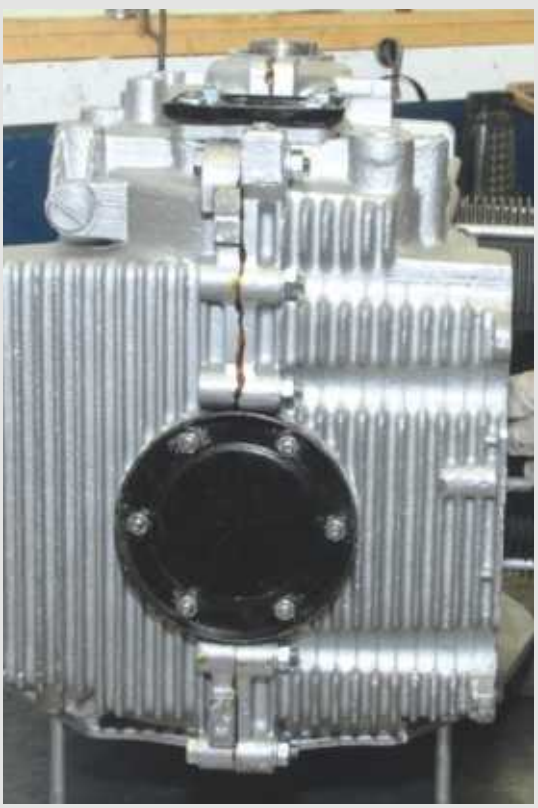
The VW flat four is a precision instrument, which does not rely on paper or otherwise gaskets to remain oil tight. However, after years of use and when re-using second hand parts, while perfectly acceptable, a little help may sometimes be needed. See that wavy black line between the case halves in the picture below? That's about the only place you should find gasket sealer on a VW flat four engine. Anywhere else and the chances are someone has tried to bodge a fix to a problem. The VW Engine Company recommends Loctite 518 or Permatex Aviation 3H as a non-setting liquid gasket for the case halves.

Graphogen (see www.graphogen.co.uk) engine assembly compound is also very useful and can be used on bearings, the crankshaft, valve stems, the camshaft… in fact, pretty much any working surface of an engine, in limited quantity, during assembly. Buy some, it's good stuff.

Oh, and don't forget to replace the rubber o-rings on the case studs, and always use new pushrod seals.

When it comes to lubrication, the Catford-based specialists recommend 20w50 oil for all their engines.

> "Buy some Graphogen, it's good stuff"



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Not *Just* Kampers

We dropped in on Just Kampers at their HQ in Odiham, Hampshire for a chat with the company who refuse to compromise on quality

Words and photos Ian Cushway

^ Mark Reynolds and the '56 Beetle he plans to campaign with son, Josh, as co-driver in the gruelling 2017 Mille Miglia

For those of you who haven't heard the story before, Just Kampers was founded back in September 1989 on Mark Reynolds' 22st birthday as a vehicle restoration business. Mark had to wait until he was 21 before he could set up JK because he couldn't get motor traders insurance before then.

Over the last 27 years Mark Reynolds and his team have grown JK from a tiny garage working on Bays and Beetles to one of the biggest names in the UK VW scene, but they've managed to keep the 'family feel' within the company.

When we arrived at JK HQ in Hampshire we were glad we drive a VW, as the whole bottom half of the car park is reserved for VW parking. There was a dozen or so 'dubs of all kinds parked up by members of the JK Team, so we took a few minutes to take a look at what they drive before we went inside.

We met up with Mark to find out how the JK Story unfolded and quiz him about his 'no compromise' approach to quality.

VolksWorld: **Hi Mark, what was behind the decision to set up a specialist parts business?**

Mark: *"I was a welder by trade, and in the late '80s I started a VW restoration business in Bagshot, Surrey doing up VW Campers before moving to Wrecclesham and then Farnborough. The business was expanding fast, but we were struggling to find parts. I was on a (rare) family holiday in Malta when I heard about a hoard of VW parts being sold off by a former VW dealer. I hired a 20ft container and had the parts shipped back to the UK. We used some of the parts on the vehicles we were restoring and sold on others to people who were also struggling to find parts. This is where the*

< JK employ a team of skilled metalworkers at their Hampshire HQ

Just Kampers

Preservation Parts is the name of JK's own 'best quality' range

> "If I wouldn't fit it to one of my own VWs, I won't stock it"

Sourced from the original supplier, JK exclusive steel wheels are available in multiple styles, widths and bolt patterns

If the right parts aren't available, JK make them themselves

Warehouse is impressive to say the least

parts business really took off.

"In 1996 we shut the workshops and moved around the corner to North Camp to sell parts and accessories full time. It wasn't long before we'd filled the whole building with a mix of new and second hand parts and also filled four containers in the yard. By 1999 we needed a lot more space, so we moved here to Odiham. Even today we've still got customers who've been buying from JK since the mid '90s! They come along to the JK Open Day some times and it's great to see them!"

VolksWorld: **So you started selling second hand parts, but now quality is your main focus?**

Mark: *"Yeah, absolutely. The parts we were getting second hand were usually taken straight from scrapped vehicles. I used to fly out to the USA five or more times a year to scour 'junk yards' for old Busses and Bugs. The stuff that used to be scrapped back in the 90's would be seen as perfectly okay to drive these days. It's crazy looking through the old photos at the stuff that we used to cut up, but there just wasn't the same appetite or market for the vehicles back then. So the second hand parts we used to sell were always OEM, but these days we only stock new parts.*

"We've been to five continents in search of the best quality parts to stock here at JK. It's a full time job. Not only have we got to ensure that the parts we're looking to buy are of the best possible quality, but we also ensure that they're made ethically. We always check that the factories don't use child labour, that the working conditions

Just Kampers

JK has over 200 of their own panels in stock and the range is constantly growing

are up to par, and that the environmental impact of producing and getting the parts is as low as possible. I've always been obsessed with the quality of parts. If I wouldn't fit it to one of my own VWs, I won't stock it. I'm sure we could make more money if we sold substandard parts and didn't invest so much in creating top quality bits, but it doesn't seem worth it to me. That's not the kind of company I want to run."

***VolksWorld:* How does that translate into what items you stock?**

Mark: *"It means we try wherever possible to only buy from the people who made the parts in the first place. For cables we go to GEMO because their throttle cables, for example, are made properly so the ends don't drop off. We buy from Febi, Elring, Lemforder, Bosch, Ernst, HJS, the list could go on and on. For example, the V-belts we stock are from Optibelt."*

***VolksWorld:* You mentioned investing in creating new parts. How many products do Just Kampers produce themselves?**

Mark: *"We manufacture over 460 products ourselves now. Many of them are made right here in the UK, and some of those are made in the workshop next door. The team over there have decades of experience with metalwork on all sorts of classic cars, so the panels that they make are incredible.*

"These 'own brand' items came about when we saw a real rise in demand amongst VW owners for parts that you could 'fit and forget'. We took this as an opportunity to get out there again and get in touch with suppliers from around the world. We spent months, almost years, trialling, testing and sampling products from all over the place on our own vehicles. The ones that made the cut were put into the Preservation Parts line, which is our own 'best quality' range. The window rubbers we supply, for example, are made in the UK to the original specification on the same production line that also makes the latest Vauxhall window rubbers, so the quality is excellent. Another good example is the cupro nickel brake pipes that we've had specially made for us. The pipes available previously didn't fit that well, so we listened to our customers, researched the correct dimensions for them and had them made in the UK. It's an ongoing process, and we're adding to the range all the time."

Parts are sourced from OE suppliers the world over and stored at their Odiham HQ

With an ever-expanding product range the JK warehouse is like an Aladdin's Cave for VW fans!

Only the best quality bits will do for Mark and the crew at JK

***VolksWorld:* Does this mean you also recreate obsolete parts?**

Mark: *"Absolutely. We've invested a lot of time and money into creating the tooling to remake parts ourselves. Our new Bay inner sills, for example, are made to the exact right length with all the drain holes etc in the correct places, so they're exactly as they were on new panels. They're meant to fit by cutting out the old metal and replacing it, rather than just patching it over the top. We've now got over 200 of our own panels in stock. Again, this is a range that's constantly growing."*

***VolksWorld:* So are your front T2 4-inch narrowed beams made here?**

Mark: *"Yeah, we make them ourselves right here at JK HQ. They've got a CDS seamless tube with laser cut end plates,*

Mark started off in the 1980s doing up old Campers, now he sells all the parts for them

JK pride themselves on quick delivery and customer satisfaction

> "Most of the staff drive their own VWs here and work on them at lunch or after hours"

and we supply them with German bearings and a Febi steering centre pin. All the grease nipples are in the same place as the originals, and we've made it so it can be made to fit both left- and right-hand drive T2s. It's just about making sure that each element is correct and every aspect is 'right'."

VolksWorld: **You've branched out into camping stuff as well, right?**

Mark: *"We did! We've got our own range of camping accessories in our Camper Shop, where we sell our own melamine dining sets, Spacemaker awnings, sun canopies and all sorts of outdoor and camping gear."*

VolksWorld: **So, where do you go from here?**

Mark: *"Well, we've started stocking parts for newer Campers like the T5 and T6 and also we've expanded the range of panels that we make here at JK HQ. We've recently redone our website to make it more user friendly and we're in the process of re-organising our warehouse which has become something of an annual tradition!"*

VolksWorld: **So what's it like to work at JK HQ?**

Mark: *"I know it's a cliché, but it really is like a family. We've got people who have worked here from the start, like Pete, our Product Development Director, and people who have come back to the fold after years away. Paul worked with us back when we were based in Farnborough. His daughter actually works here now, too. She's helping out in the warehouse part-time between her college work to pay for the work on her first Beetle. Most of the staff drive their own VWs here and work on them at lunch or after hours. They all get a good discount on parts, which is handy, or Luke in the warehouse would never make it to work. He's one of the youngest members of the JK Team, and he's got a 'character building' Beetle that periodically breaks down on him. I grew up with VWs, so I know what it's like, but now I feel like I'm growing older with them too, so I'm glad I've got a nice reliable T6 as well as my Beetles!"*

VolksWorld: **On a personal note, Mark, what are you up to?**

JK ball joint Bus beams feature CDS seamless tubes with laser cut end plates and a Febi centre steering pin. They are available in stock width and 4-inch narrowed

Mark: *"Good question! In 2016 we brought over a whole fleet of rare and unusual VWs from Brazil, which we had at The* VolksWorld *Show. We kept the SP2. It was just too good to let go! My next project is to prepare an entry for the 2017 Mille Miglia. You enter in November, but don't hear for sure you have a place until spring! It's a 1000-mile race through Italy, and I'm hoping to do in my 1956 Beetle with my son, Josh, who also used to work here. He does some freelance work for us now as a writer, but we're both really keen to tackle the 1,000-mile race. It'll be fun, but also quite a challenge. I drive a T6 van everyday, but if it's dry, then I'll take my 1967 Beetle Cabrio, or the Oval to work."* ■

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Full metal jacket

Part 6. After a solid four month's work on the chassis and body, nearly 50% of the original body has been replaced. In that time it's gone from a 'basket case' to a full metal jacket, with the correct panels and parts that will ensure this car's restoration lasts the test of time

Words and photos Lloyd Jackson

I'm not going to say it's been an easy job. Projects like this really test your patience, sanity and bank balance. Our aim all along was to save a 1950 matching numbers car from being cut up and sold for parts, though there have been times when we have said that would have been the best option! Before we started, looking through rose-tinted glasses, we expected to spend around two days a week for around four months on the metalwork. In reality, we've spent four days of every week working on the car, and still have bits of the chassis to finish.

But standing back and looking at the bodyshell now, all the lows disappear and a feeling of achievement takes over. The body looks amazing. None of our repairs can be seen and it looks like it would have done when it was first put together in the factory 66 years ago, right down to the last spot weld. That was our goal.

From here, the 'shell will go to Spike's Vintage Restorations for body prep and some of their famous 'mile-deep' paint. These guys are booked up for at least 12 months, but have been amazing and agreed to support this project. There's a lot of love going into this build.

We have complete faith in these guys, as the last car they painted for us was our hand built 'Country Buggy', which they turned round in 48 hours, and painted twice as we didn't like the colour we'd chosen first time round!

The Buggy was very different to this though, and even though there's six weeks to go before the car is booked in with the trimmer for its new headliner and interior, there's a ton of work and hours needed to get it to the show standard we are aiming to achieve. If that all goes to plan, it will then return to us for the final build up in time for its debut at The *VolksWorld* Show in March.

This is a very exciting stage for us, as when we next work on the car it will be painted and trimmed, so we'll be swapping our dirty welding gauntlets for clean nitrile gloves.

> "standing back and looking at the bodyshell now, all the lows disappear"

^ Firewall panel and fuel tank to dash support panel, spot welded in and looking factory fresh. Just how we like it!

> The front quarter had seen some action and was beaten and peppered with rot. We were fortunate in that a friend had a pre-'55 front quarter body cut left over from his own restoration that we could use. As many readers will know, a pre-'53 Beetle is slightly different to a pre-'55 in many areas, but thankfully the area that differs in this section did not need replacing. This was a stroke of luck for us as sourcing good, early body cuts is a real challenge. Thanks Steve Brown

^ When we cut out the damaged area, we left the wing bolt section in place and used it to position the new panel and ensure perfect panel fit. Note how the swage lines at the top are nicely aligned. This isn't the easiest way to do a panel join, but guarantees a good fit. If anything was incorrect with the position of this join it would show on the swage lines

Shaping the j-section is almost impossible without the use of a stretcher, which allows you to achieve the perfect curve for the bonnet seal trim

^ This shot shows the original front valance spot welded back into position and the area in copper primer where the j-section that holds the bonnet seal in situ will fit

> The use of a good spot welder is key to obtaining a factory-style finish. If you ever want to do this job yourself, hire or try and borrow a good spot welder as, although a MIG tack will do the job, it never looks quite as nice

^ It's not just about the right tools either. If you want your repairs to look factory, look carefully at how the factory did things. The original spot weld spacing was measured, and then new ones placed at the same intervals – here every 15mm. We opted to replace the seal retainer all around the bonnet opening because rust is always trapped in this area. Remember the copper weld-through primer, okay?

^ Some chump had drilled two holes for a dual-mount aerial, which needed welding up. To do this we cut out two metal discs to fill the holes, and then ground the welds down to make the repairs flush. Go carefully here, this area is easy to warp.

< Note the lighter patch of lead work at the bottom of the picture. This is a great way to deal with pitting and imperfections, as you will see over on the next page

> Next job was to mock up the wings and bonnet, making sure all gaps are correct and that the bonnet opens and shuts as it should. The wing in the photo was a second hand original Split one we picked up from a friend. It needed a little metal repair in the headlight bowl, and had some dents and damage we needed to put right, but it was a great start

< As the damage wasn't too extensive, we re-shaped the wing on the car using a hammer and dolly and then had it media blasted inside and out before starting on the headlight bowl repair

1950 Split Bug

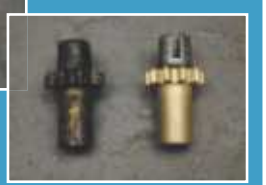
^ > v Early Beetles have a metal headlight wiring tube that goes from the bottom of the headlight bowl to the inner wing. The one on our genuine wing had rotted out (a common problem) and the bowl needed a localised repair

^ Removing the engine lid support panel is a lot of extra work, but it's the only way to access the area behind the air intakes and achieve the highest standard of restoration here

^ Here's the panel removed from the car. Shot blasting showed up a few rust pin holes on the inner side, which we welded up before detailing the panel in readiness for re-fitting once it has been painted. With this removed, we were also able to access the internal area beneath the rear windows and ensure all rust issues are dealt with

Small is beautiful

The body may be the biggest bit, but it's just one part of the project. There are many, many other smaller parts that require refurbishment. We put these brake backing plates through the blast cabinet, prior to sending them out for powder coating. This is a dull and dirty job, but also a rewarding one, as you can see from the before and after photos



As we've said before, we're trying to re-use as much of the original car as possible, and you know what they say – nothing fits as well as the original VW parts. Even small pieces like the star adjusters clean up a treat!

Door latches and mechanisms also getting the blast clean treatment. Don't they look better?

Trinket pimp

^ Semaphores were one of the parts we were struggling to find as good, early ribbed ones are far from common. In the end, we bit the bullet and bought these September 1950 stamped ones from Bob at BBT in Belgium. They're perfect for our October 1950-built Bug but, as anyone who has tried to source a pair of these in this condition will know, they cost about the same as a family holiday somewhere hot!

> We've gone a bit radical here. Pope's noses aren't usually chromed, and are definitely an acquired taste when they are, but I think this will look awesome against the car's original colour of Bordeaux Red. Besides, it's in great condition and, if it doesn't look the bomb, we always have the option of stripping and painting it

< Moving back to the front of the car, the scuttle panel needed a little repair. It's not the easiest place to repair, but we were spurred on by the fact this is the last piece of metal fabrication work the body needs

^ And here's the scuttle panel repaired and the bonnet – now stripped of paint – fitted in place. A little shaping up on the bonnet, setting the gaps and the body metalwork will be finished

^ And here's the bonnet gap looking spot on. It's always best to mock everything up and gap it right before you move onto the paintwork stage. It's much easier to remedy any problems now than when panels are painted

^ Finally, there were a couple of jobs left to complete inside the car. At the beginning of the restoration we removed the heater boxes, had them shot blasted and renewed the heater pipe through to the engine bay. Now they have been welded back into place, completing work to this area

^ Round horn grilles are a Deluxe Split Bug-only feature. The nearside wing has a hole all the way through, and the horn sits behind. The offside wing has these four little slots for the tabs that hold the grille in place. One for form, the other for function. Don't you just love symmetry? Had we been restoring a Standard Split, we could have saved money here as they don't have these, instead having the horn mounted externally

> And talking of symmetry, here's my favourite view of any Split Bug – looking through the rear window at the awesome symmetrical dash

^ The last job on the body was to fit the inspection hatch cover in the rear luggage deck and spot weld in the strengthening u-sections on both sides. Even though making the new luggage deck was easily the most time consuming part of the restoration so far, we're still really pleased how it turned out, and it now looks like it's never been changed

Lead loading / body soldering

Over the years, most automotive body repair methods have been replaced with quicker, easier (read: cheaper) ways of doing things. Lead loading, or body soldering as it is otherwise known, was replaced with polyester filler about 40 years ago. 'Filler' is safer, easier to use and doesn't require any special tools or skill to achieve a good dent repair. As with most things in life, though, the easiest ways are not always the best, or most rewarding, and, while there's nothing wrong with filler when applied properly, it's no match for the old school method of lead loading.

Lead loading was mainly used when cars were built to cover body seam joints where flex could crack paintwork. Or to repair minor damage that occurred during manufacture. It has also been used by car customisers since the industry began.

We are covering the process here because it's something we use on most of our restorations at some point, whether it's to help avoid panel flex on weld joins, cover pitting from corrosion or dents that can't be pulled out like in a window post or similar. So here's a little step-by-step.

Tools of the trade

These are the tools required. The grey matter is tinning paste, which is used as a flux to make the lead / body solder adhere to the metal. The white matter is wax, used on the wooden paddles to stop the lead sticking to the paddle. Then there is a lead stick and a number of lead-free body solder rods – more commonly used these days for health and safety reasons – and at the bottom an adjustable body file that can be shaped to the panel, used for filing down the lead after it's applied.

NB: A side benefit of lead-free soldering sticks is they work at a slightly lower temperature, so there's less chance of warping the panel with heat from the blow torch

1

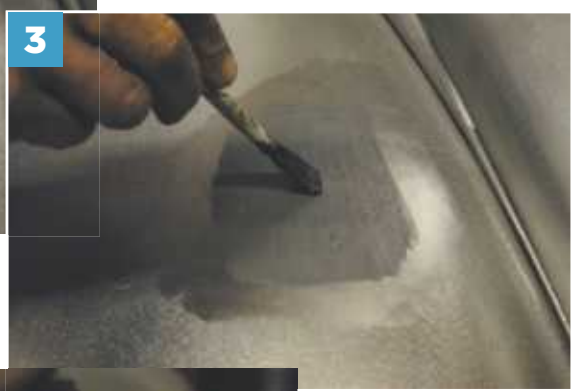
^ This is a typical situation when we would use body solder. The top of this wing is sound, but there's some pitting around the small depression evident in the middle of this shot

2

> The first stage in preparing for lead work is to thoroughly clean the area to remove any rust or dirt from the base of the pitting. We use a brass wire wheel to clean deep into the area. The pitting is now much more obvious

v First, the tinning paste is painted over the area with a brush. This will assist the lead / solder to adhere to the metal

3



4

^ Then the paste is heated with a blow torch, which removes the moisture and turns the paste into a metallic base

5

< Working fairly quickly, the area is gently rubbed with a wire wool pad while it is still hot. It will turn a shiny, silvery colour at this stage, and ensures the area is devoid of any unwanted residue that will interfere with your lead work

Next month

We will check in on progress at the bodyshop, as well as bringing you an update on the engine and gearbox rebuilds

< Next, warm the panel again with the blow torch and start applying the lead / solder. This is the tricky part. Too much heat will warp the panel and the solder will run off without adhering to the metal, especially on a curved area such as this. Too little heat and it won't melt or stick. Always apply slightly more lead / solder than needed as you want to be able to move it around with ease

> Plenty of body solder / lead here to work with. If it cools down too much, you can gently re-heat it with the blow torch, but go carefully

^ While the body solder is hot, it is spread across the work piece using a wooden paddle dipped in tallow to stop the solder sticking to the wood. The lead / solder should be the consistency of peanut butter (smooth, not crunchy!) at this stage for ideal spreadability

> "The lead / solder should be the consistency of peanut butter (smooth, not crunchy!)"

^ When it has cooled and dried solid, the body file is used to do the initial shaping. Note how the file has been adjusted to conform to the panel shape. After a couple of minutes of filing, the lead / solder is almost to the shape of the panel

< Lead is much softer than steel so as the piece is being filed, the lead is removed but the panel around it should be barely scuffed

> Orbital sanding lead is a big no no as the dust created is highly toxic. This is another reason we generally use lead-free soldering sticks, but you should still wear a good quality mask when sanding

Finally, when you've finished working on the area and you're happy with the result, you need to clean up. This may not sound important but, if you don't clean the area around where you have been applying lead / body solder, you will find the metal covered in red surface rust the following morning. We recommend cleaning the surrounding area thoroughly with a high quality panel wipe or thinners. Job done

If you fancy giving this process a try, practice on something you are prepared to throw away first! And when you're finished, leave it for 24 hours to check for any rusting or oxidisation that may occur before painting.

Good luck.

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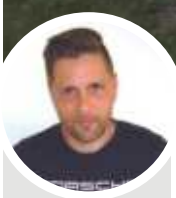
My Bus already has so much character, but a little more couldn't hurt, could it?



History in the making

James gets his detail on and starts spending money

OWNER INFO

NAME James Peene

JOB Contributor, writer

CAR '69 Bay Window, '60 Beetle

WORK THIS MONTH Faux history and wheel detailing

I'm back on a Bus vibe this month, although truth be told, not a great deal has been happening on the surface. Behind the scenes, however, is an entirely different matter. It's been a case of spend, spend, spend in the Peene household as I've been amassing parts for the Bay's transformation. And by transformation, of course, I mean slamming and rimming.

When I bought the Bus, and as you see it now, it was already lowered a smidge on some ball-joint dropped spindles. The beam isn't narrowed and because I favour a skinnier look, I've bought a 4in narrowed jobbie, with adjustable caster angle from DogBack Beam Performance. It's a link pin set up, so I've also had to track down the rest of the gubbins, like king and links, carriers, dropped spindles, trailing arms, leaves and so on.

It's not been as easy as you'd think, with parts that were supposedly sent out going missing. Just trying to find someone who'd send stuff out when they said they would has caused no end of problems and delays. Indeed, a lesser man than myself would get all hot and bothered about it, but I'm in no rush and the work will begin as soon as all the bits arrive.

What the Fuchs?

Truth be told, the delay has given me time to detail the wheels I intend to fit. Yes, call me Mr. Obvious, but I've gone for Fuchs again! I did consider another type of wheel, but decided my Bay needed a bit of bling and detailed Fuchs from Flat4 are always just the ticket.

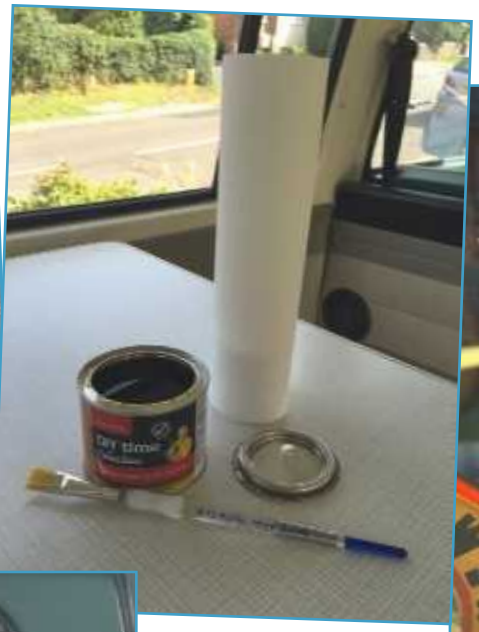
I've put it off as long as I could, but at the time of writing this, there are freshly taped up wheels on my dining room table waiting to be painted. As soon as they're done the Bus will head over to Johnson Autoworks, where some time on the lift has been arranged so it can have the chassis notched and the new suspension installed.

When it comes back all low and impractical I'll finally have somewhere to store it. I've rented a couple of shipping containers that should be dry and secure enough to store all my assorted paraphernalia / junk over the winter months.

Now, a few people have warned me about storing a vehicle in a container, but I can't see the problem. Correct me if I'm wrong, but aren't they designed

Vintage travel decals are plentiful on ebay.com. They're not cheap, but quality never is and they are fabulous

Besides a bowl of water, this is the only equipment you need for the install



Once they're dry you need to give them a coat of varnish to protect them from being damaged

They will look even more authentic when they've faded

Yet more masking up. All told, this is the sixth set I've detailed

> "Call me Mr. Obvious, but I've gone for Fuchs again!"

Wheels for the 'wagen. 5.5-inch Flat 4 Fuchs, again!

to keep cars dry whilst being shipped across the high seas? Mine has only been used for one shipment, so it should be hunky dory and condensation shouldn't be a problem, as long as I don't put the Bus in there when it's soaking wet. We'll see if I come to regret this decision…

Stick it to 'em

The only physical changes to the Bus since it last graced these pages is the addition of some fake history. I love the vintage travel decals you find on old Campers, but sadly mine didn't come with any. Not to worry. You can find bundles of them on ebay.com so I spent a few evenings trawling through the ads until I found some designs I wanted. Basically, my thought process was to buy decals for all the places I would have visited in the Bus had I been the one to buy it new back in the day. I'd definitely have gone to see the Saturn V take off for the moon landing, hence the Cape Kennedy decal. I've been to New York and Florida and the Bus eventually ended up in Arizona, so it all makes sense to me. And they add a splash of character to the Bus. Not that it needs it, from all the comments it gets from the neighbours about its paint it's characterful enough. Wait until they see it slammed on Fuchs… ■

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OWNER INFO

NAME: Ian Cushway

OCCUPATION: Editor

CAR: '68 Beetle, Audi A6 Avant, T5 Transporter

WORK THIS MONTH: Sorting the rear end ride height

Bum deal

Ian tackles the rear end ride height on his Bug

I just couldn't bear looking at the back end of my Beetle any longer so decided to set about lowering the rear suspension. I'd read how to do it, courtesy of an article written by regular contributor Mark Walker, published in July 2014, but I have to admit, I had a few reservations about doing it myself. I managed to get it done – but there were a few hiccups along the way and, to be honest, it wasn't as straightforward as I'd hoped. It didn't help that for some reason the rear wheels had a fair amount of positive camber on them before I started, which meant I had to compensate for that when working out how many splines to lower it. To make matters worse, the torsion bar pulled out at the inner end on one side so I immediately lost all of my reference points and this effectively meant I ended up doing both sides twice.

Hindsight is a wonderful thing and in retrospect, it would have made sense to have invested in an angle finder rather than rely on the marks I'd made on the end of the bar. Ho-hum.

When doing this kind of job there's a couple of things to bear in mind. Firstly, you need a decent set of axle stands so you can feel confident when releasing the tension from the spring plate. You also need to soak everything, preferably the night before, in release agent to make undoing easier, and you need to take your time – not rush things. Also, be mindful of how low you go – especially if you're ever likely (like me) to be carrying anyone in the rear.

With that in mind, here's how I did it.

< I began by releasing the tension from the handbrake cable to allow rearward movement of the rear drum to enable it to clear the spring plate. I took the easier option of slackening off the two 10mm nuts rather than taking the drums off (again) and unhooking the cable from the shoes

^ With the lower shock bolt undone (using a 17mm and 19mm spanner) compress it out of the way. Now, it's a case of undoing the three 19mm nuts and bolts which hold the axle tube to the spring plate

> Time to tackle the four 15mm bolts holding the spring cover in place. It's worth taking a bit of time cleaning up the bolts and straightening out the plate so you can get your socket seated securely. Once they're out, pry off the torsion bar cover and rubber donut

> I then marked the position of the torsion bar in relation to the spring plate. I used a quick drying enamel, which worked okay, but because the teeth are so fine the line I applied was a little too thick, which dmade it difficult to determine the number of splines I had rotated the spring plate by

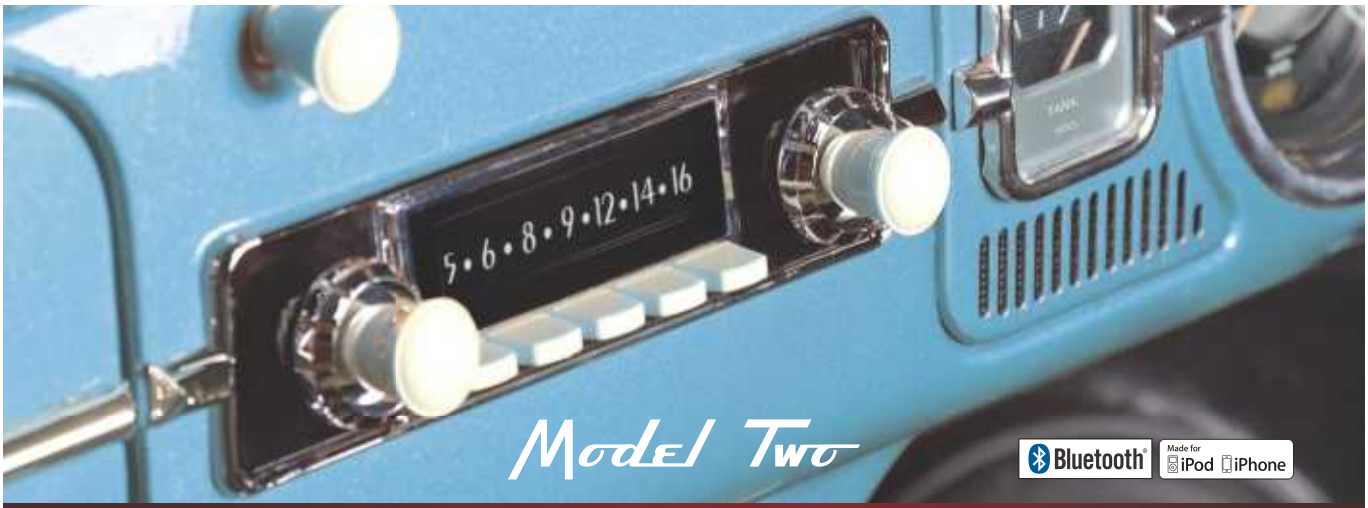
> "I ended up doing both sides twice"

v Once this was done, I carefully manoeuvred my trolley jack under the spring plate and started to wiggle the plate off the torsion bar. When it started to come off, I tentatively levered the spring plate off its stop with a tyre lever and lowered it with the jack. As my car was sitting so high, I chose to rotate my spring plate two outer splines up (clockwise), which equates to roughly a four inch reduction in ride height (one outer spline = eight degrees = two inches). For reference, one inner spline will move the spring plate by 10 degrees, or 2.5 inches

< When replacing the torsion bar covers, be sure to apply rubber grease to stop them from squeaking. Add some copper-based grease to the bolts, just in case you need to get them out at a later date. Slide the cover plate back on and torque the 19mm bolts to 72ft.lbs

v As it happened, I ended up taking the whole lot off again and more by luck than judgement, managed to get the result I was after. It's not exactly low, but I've managed to dial out the silly positive camber that it had originally. A good tip here is not to torque everything up until you've got both sides the same and to the height you want. Don't forget to re-adjust the handbrake cable before sitting the car back down on the ground. Now I've sorted the rear camber, I just need to do something about the front! ■

> Despite my best efforts, the torsion bar came off the inner splines on one side, which meant I'd lost all my reference points. Once I'd made a best guess and put it all back together, one side was too low, the other too high! I should have used an inclinometer / angle finder



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VOLKS WORLD

Here's what's coming up in the March 2017 issue of *VolksWorld*, on sale Friday 13 January

Class of '78

Now, who said late Bugs were boring?

Don't miss it!

Friends and family

David Powell restored his 1978 camper with a few subtle owner-inspired modifications and lots of help from his friends

Fire away!

Fire is the enemy of all air-cooled enthusiasts, so we show you how to install a Daus fire extinguisher system to your Bay

Colour chart

We explore the history of Volkswagen's kaleidoscopic choice of colours throughout the decades

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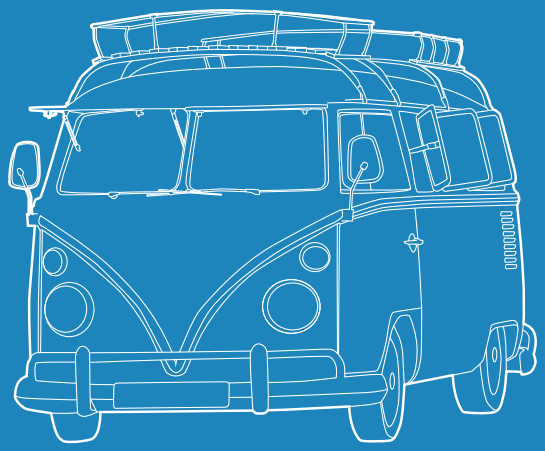

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HOW TO
Replace a Bay Window Bus fuel tank

All tanked up

Rid your Bay Window Bus of its old leaky fuel tank and replace the pipework at the same time

Words and photos Rob Hawkins

The fuel tank on a Bay Window is hidden away in front of the engine (concealed by a removable panel) and behind the rear seat squab. It's generally forgotten about until the smell of petrol emerges and action needs to be taken before posing a potential fire risk. Petrol fumes and leaks can be caused by a number of issues, which have become more widespread due to the increasing levels of bio-ethanol in petrol. We've heard of petrol tanks corroding because the latest fuels seem to generate more moisture, carburettors can become blocked if the engine hasn't been run for a long time and fuel lines and filler necks have broken down more rapidly.

The petrol tank in a Bay Window uses a series of expansion tubes as breathers. This pipework is largely made of metal, but some sections are joined by short lengths of rubber hose, which should be renewed.

The following steps show what's involved in removing a fuel tank and renewing the fuel lines and filler neck. New fuel tanks are available along with fuel lines and the correct shape of filler neck. Make sure you buy the latest fuel pipe that is capable of withstanding modern petrol.

JOB INFO

TOOLS NEEDED
Angle grinder (optional); blunt screwdriver; drills and drill bits; fuel cans; hammer; screwdrivers; sharp knife; 8-17mm sockets/spanners; trolley jack;two large axle stands; vice grips; wheel chocks

MATERIALS USED
Fuel feed hose; sender unit; fuel filler neck; various pipework

TIME TAKEN
8+ hours

COST DIY £250+

Removing the old fuel tank

01 CLAMP THE FUEL LINE Have a selection of empty petrol cans ready and waiting. Look underneath the rear of the vehicle (forward of the engine) and find the fuel line that runs from the fuel tank to the fuel pump. This fuel line should have an inline fuel filter fitted, but it may be found inside the engine bay. Clamp this fuel line with a pair of vice grips

02 DETACH AT THE FUEL PUMP Disconnect the fuel line at the fuel pump, which will be located inside the engine bay. On early models, there's a mechanical fuel pump next to the distributor, whereas later models will have an electric pump mounted elsewhere in the engine bay. Do not disconnect the fuel line between the pump and carburettor. Instead, disconnect the other fuel line that's attached to the fuel pump

03 DRAIN TANK Carefully pull the fuel line through and put the end inside a petrol can. Mop up any fuel that spills onto the floor. The petrol will drain more quickly if air can get into the tank to force it out, so release the fuel filler cap. Watch the fuel level inside the petrol can or container and make sure you have another container ready to use

04 RAISE THE REAR Whilst the petrol is draining out of the old fuel tank, chock the front wheels, raise the rear of the van underneath the gearbox mount and secure the vehicle with at least two axle stands positioned underneath the rear chassis rails. This will help with removing the engine, which is necessary to be able to in turn access and remove the fuel tank

Replace a Bay Window Bus fuel tank

05 REMOVE ENGINE Detach the wiring, throttle cable, heater cable and remove the engine bay tinware to allow the engine to be removed. The engine is secured to the gearbox and a mounting bar with 13mm and 17mm nuts and bolts. Support the engine on a large trolley jack to lift it off the gearbox and slide it out from the rear of the vehicle

06 REMOVE BACK PANEL There is a steel plate at the back of the engine bay, which conceals the fuel tank and is usually secured with a series of crosshead screws. Carefully undo all of them – they may be corroded. There are two screws which are accessed from underneath the bottom edge of the panel and require a long screwdriver to locate them. Any screws that cannot be undone will need to be drilled out. Remove the panel when it's free

07 UNDO TANK STRAPS The petrol tank will now be visible. It's secured with two straps, which have studs welded onto their ends and are secured with nuts. Try to undo these nuts. If the stud shears off, all is not lost. The remains of the stud will need to be drilled out later and a nut and bolt fitted. Providing the strap can be detached, the tank can be removed, so don't worry if the stud breaks in two

08 RENEW FUEL FEED PIPE Remove the fuel line between the petrol tank and the fuel pump, which was disconnected and used to drain the tank in steps 2 and 3. This should be renewed and consider whether the location of the fuel filter is safe and easy to access. You may wish to renew the fuel line (always recommended) and decide on locating the fuel filter inside the engine bay where it's easy to access and inspect

09 REMOVE BREATHER PIPES There are two breather pipes routed across the top of the fuel tank. Note how these are fitted, then remove them by detaching them at the rubber hose connections. The short lengths of rubber hose must be renewed with modern fuel pipe, but the metal pipework can be refitted later if it is in good condition and not damaged

10 DETACH SENDER WIRES Locate the sender unit on the top of the fuel tank. This has two electrical wires attached to it, which are used to send a signal to the fuel level gauge on the dashboard. Make a note of how these wires are fitted and disconnect them. They must be refitted to the new fuel tank to ensure the fuel level gauge works properly

11 DETACH FILLER NECK There may be a circular removable panel to the right of the fuel tank to allow access to the filler neck and pipework (if not, look around the side of the fuel tank for the filler pipework). Undo any jubilee clips that secure the different sections of the fuel filler neck together. Detach the end that's secured to the fuel tank

12 REMOVE FUEL TANK Carefully manoeuvre the fuel tank out and into the engine bay. Make sure the filler neck is detached and the tank straps are not obstructing. The old fuel tank should be empty of petrol, so it will not be very heavy, but it is awkward to move. An extra person may help here to avoid damaging the van's paintwork, especially when it needs to be eased out through the engine lid hole

Replace a Bay Window Bus fuel tank

Fitting the new tank and fuel lines

01 FIT NEW SENDER Take the new fuel tank and make sure it is the correct size and shape as the old one. Fit a new fuel level sender into the tank with a new rubber O-ring. Twist the sender unit into the hole in the fuel tank, then use a hammer and blunt screwdriver to carefully tap it around in a clockwise direction and secure it tight in position

02 REMOVE OLD FILLER NECK Undo four small screws where the fuel filler cap is fitted, then remove a metal circular disc that secures the end of the fuel filler neck. The old fuel filler neck can now be removed from inside the engine bay. Push the end of the neck through at the fuel filler cap, then pull the entire neck through and out. This may take a few minutes to complete

03 CHECK NEW FILLER NECK Compare the old and new filler neck components to make sure they are identical. A steel tube, which is part of the old filler neck, may need to be reused if a new one cannot be sourced. However, it's worthwhile renewing the elbow at the top, the rubber pipe that's connected to the fuel tank and any jubilee clips. Assemble all of the components before refitting them

04 FIT NEW FILLER NECK Manoeuvre the new assembled filler neck (elbow, steel and rubber pipe) into position from within the engine bay. Ask someone to carefully pull it through at the filler cap end and line up the four mounting holes for the circular disc removed in step 2. Do not refit the four small screws that secure the top of the filler neck. This will be done later in step 8

05 TEST FIT TANK Trial fit the new fuel tank into position, making sure the two metal securing straps can be fitted and all outlets are accessible. You may discover some of the outlets are obstructed if holes in the bodywork are not large enough. We found we needed to modify the bodywork to ensure all the outlets were accessible

06 MAKE MODIFICATIONS If any modifications are required to the bodywork, remove the fuel tank and cut out or enlarge any holes that are required to access all the outlets on the fuel tank. This may take some time to complete and will require the new fuel tank to be trial fitted several times. Take your time at this stage, making sure all parts can be fitted onto the new fuel tank

Replace a Bay Window Bus fuel tank

07 REPAIR BROKEN STRAP STUDS If the stud for one or both of the securing straps sheared off when attempting to undo them in step 7 of the previous section, they will need to be drilled out and a new nut and bolt fitted instead. This is awkward to do and time consuming. Start by drilling a 3-4mm pilot hole through each broken stud, slowly working up to larger drill bits

08 SECURE FILLER NECK Fit the new fuel filler neck onto the fuel tank and secure with a new jubilee clip. Refit the circular disc at the filler cap end and the four small screws. Make sure the entire fuel filler neck is secure by checking all the way along it with your hand. Once the engine is refitted, there won't be much room to access it

09 RENEW EXPANSION PIPE HOSES Renew the short lengths of rubber pipe that are fitted onto the ends of the metal expansions pipes. The old ones will probably be brittle, so cut them off with a sharp knife. Fitting the new rubber hoses can be difficult, so warm up the ends in a container of hot water. This helps to soften and expand the rubber, making it more pliable for attaching to hard pipes and outlets

10 PIPES IN THE ROOF Trace all of the expansion pipes inside the engine bay and renew all of the short lengths of rubber hose. There may be a few of them attached to the underside of the engine bay roof. It's worthwhile renewing them to reduce the risk of petrol fumes escaping and causing a fire

11 RECONNECT SENDER Refit all of the expansion pipes, including the two that were routed across the top of the petrol tank. Make sure these are securely fitted with little risk of them falling off and leaking petrol fumes. Refit the wiring that's connected to the sender unit on the top of the fuel tank – make sure the wires are correctly connected the right way round

12 TEST FILL TANK Fit a new length of pipe from the appropriate outlet on the petrol tank to an inline fuel filter and a second pipe from here to the fuel pump. Pour some petrol into the tank via the filler neck and look for leaks. Refit the panel that separates the fuel tank from the engine, then reinstall the engine. Test run the engine, making sure there are no fuel leaks and the fuel gauge works correctly. And that's it!

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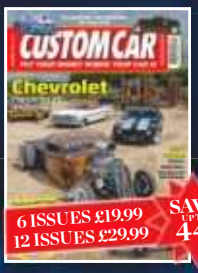

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1970, £4,000 ono. 1600cc, Empi Spin Star wheels, turbo exhaust, twin choke, Weber carb, radio & CD player, new floor pans and heater channels, new interior and other parts. Suffolk. 01359 230397

BEETLE 1300

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POLO

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VW TRANSPORTER

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2013 VW T2 5 Seat Classic, only 9,540 miles, 1.4 water-cooled petrol engine, custom camping interior, single portable camping stove, 12v fridge, sink, leisure battery, high spec CD radio & more. **£30,995**. Ref: XDM

2010 VW T2 5 Seat Classic, only 18,089 miles, 1.4 water-cooled petrol engine, custom camping interior, single portable camping stove, 12v fridge, leisure battery, full vinyl trim with matching door cards, raising roof, alloy wheels & more. **£29,995**. Ref: DWW

2015 VW T2 Danbury Rio 4 Seat Classic, only 5,100 miles, 1.4 water-cooled petrol engine, 2 burner hob, grill, sink, fridge freezer, leisure battery, 240v mains hook up, raising roof, roof bed to make 4 berth, alloy wheels, power steering & more. **£47,995**. Ref: BXW

2012 VW T2 Danbury Diamond 5 Seat Classic, 28,000 miles, 1.4 water-cooled petrol engine, 2 burner hob, grill, sink, fridge freezer, leisure battery, 240v mains hook up, raising roof, roof bed to make 4 berth, power steering & more. Brand new camping interior. **£46,495**. Ref: SRZ

2004 VW T2 Danbury Rio 4 Seat Classic, 46,250 miles, 1.6 air-cooled petrol engine, 2 burner hob, grill, sink, fridge, leisure battery, 240v mains hook up, raising roof, alloy wheels, power steering & more. **£29,995**. Ref: MFO

2015 VW T2 Danbury Rio 4 Seat SE, only 1,645 miles, 1.4 water-cooled petrol engine, 2 burner hob, grill, sink, fridge freezer, leisure battery, 240v mains hook up, raising roof, leather trim, full chrome exterior, power steering, alloy wheels, custom painted dash & much more. **£51,995**. Ref: OMW

2009 VW T2 Danbury Rio 4 Seat Classic, 22,636 miles, 1.4 water-cooled petrol engine, 2 burner hob, grill, sink, fridge freezer, leisure battery, 240v mains hook up, raising roof, roof bed to make 4 berth, alloy wheels, leather trim & more. **£33,995**. Ref: AEK

2013 VW T2 Kombi People Carrier, 37,000 miles, 1.4 water-cooled petrol engine. Ideal base vehicle to use as a people carrier or to turn into a campervan. Prices start **from £18,995** as a people carrier, prices start **from £33,295** as a campervan with raising roof.

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Show off!

VW Action organiser Brian Burrows comments on the sheer number of shows these days and the change in vehicles that attend them

As a show promoter over the last three decades, the major change I've witnessed is the sheer number of VW events there are these days. Back in the late '80s and early '90s when the so-called 'new wave' events were launched there were maybe half a dozen events in a full season. This created an environment of anticipation. We all looked forward to – and savoured – every event, in the same way one might look forward to seeing a concert by one's favourite band. Nowadays, shows are a bit like buses (public transport buses, rather than Splits or Bays) – if you miss one, you only have to wait until the following week and another will be along. During the summer there's often three our four different VW gatherings in a single weekend.

"During the summer there's often three our four different VW gatherings in a single weekend"

I'm not suggesting this is a negative; after all, choice is a good thing and if nothing else it possibly means show promoters have to stay on their game in order to attract visitors to spend their hard-earned at any given event. I've learnt over the years that as a show organiser, you should never take your clientele for granted. The downside of having such a crammed show calendar, in my opinion, is that often some folk will now only ever visit their 'local' VW show (or the events that are closest to them) and therefore what should be a national event can suffer in terms of attendance. It also means that less and less like-minded folk are meeting up on a national level and that is a bit of a shame, as the more folk sharing and discussing all things VWs the better as far as I am concerned.

The other major difference from 'back in the day' is the rise in popularity of the Bus. Back at those early Bug Jam and VW Action events the camping fields were full of Bugs with a tent put up next to them. These days Splits, Bays, Wedges and now increasingly T4s and T5s populate the camping areas – alongside non-VW cars and vans – as folk aim for practical solutions for camping. Hopefully we will not see a time when shows are full of later water-cooled vans.

Thankfully, events like *VolksWorld* at Sandown, Stanford Hall and VW Action still attract a significant number of Beetles – and even Type 3s – for visitors to look at and admire and the show 'n' shine / concours d'elegance at these events always sees a great turnout of air-cooled classics. I really hope this continues to be the case for many years to come. While I don't doubt that many T4 and T5 owners are indeed VW enthusiasts (I own a T5 myself – in amongst my Bugs and 'Notch) – and have as much right to be at an event as anyone else – I still love seeing air-cooled cars coming through the gates. And long may that continue.

What do you think?

Agree? Vent your spleen, tell us your opinion – email volksworld.ed@kelsey.co.uk

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